



Official Grain Grading Guide

August 1, 2002

Regional offices

Pacific Region	Phone: 604-666-0488	Fax: 604-666-8703
Prairie Region	Phone: 204-983-3308	Fax: 204-983-5382
Thunder Bay Region	Phone: 807-626-1400	Fax: 807-623-8701
Bayport Region	Phone: 519-436-3190	Fax: 519-436-3195
Eastern Region	Phone: 514-283-3873	Fax: 514-283-7699

Service centres

Brandon	Phone: 204-726-7665	Fax: 204-726-7676
Calgary	Phone: 403-292-4211	Fax: 403-292-5075
Edmonton	Phone: 780-495-5462	Fax: 780-495-4711
Lethbridge	Phone: 403-382-3116	Fax: 403-382-3158
Melville	Phone: 306-728-6820	Fax: 306-728-6821
Moose Jaw	Phone: 306-692-2141	Fax: 306-694-1488
Saskatoon	Phone: 306-975-5714	Fax: 306-975-4258
Weyburn	Phone: 306-848-3350	Fax: 306-848-3353
Winnipeg	Phone: 204-983-2790	Fax: 204-984-5131

Table of contents

Revisions

- 1. Determining test weight**
- 2. Moisture testing**
- 3. Specifications for sieves**
- 4. Wheat**
- 5. Rye**
- 6. Barley**
- 7. Oats**
- 8. Triticale**
- 9. Mixed grain**
- 10. Canola and rapeseed**
- 11. Flaxseed and solin**
- 12. Domestic mustard seed**
- 13. Buckwheat**
- 14. Sunflower seed**
- 15. Safflower seed**
- 16. Peas**
- 17. Corn**
- 18. Lentils**
- 19. Beans**
- 20. Soybeans**
- 21. Fababeans**
- 22. Chick peas**
- 23. Screenings**
- 24. Experimental grades of wheat and barley**
- 25. Sample feed grain**
- 26. Standard abbreviations**
- 27. Glossary**

Revisions

This page contains a summary of some of the more significant changes to the Official Grain Grading Guide (OGGG) effective August 1, 2002. File a copy of this page at the front of the OGGG. It is the responsibility of each inspector to review the OGGG each year in order to ensure familiarity with all revisions that have occurred.

- Inclusion of moisture testing procedures for lightweight oats, Kintoki beans and Otebo beans.
- Inclusion of "Optional analysis" procedures for all grains
- Machine separations and special machine separations have been removed from the Canada Grain Regulations and the OGGG
- Removal of Canary seed (procedures to be described in a separate work instruction)
- Change in moisture conversion tables to be used for CWES, CWRW and CEWW
- Revised moisture test procedures eliminating requirement for 3 readings on every sample.
- Revised correction factors for moisture tests on light weight wheat
- Correction of formula for estimating moisture content of high moisture samples
- Addition of procedures for determining commercially clean in cereal grains
- Addition of commercially clean specifications in cereal grain charts
- Inclusion of "Export ready" and "Not ready for export" definitions
- Revised "Soft earth pellet" dockage and grading procedures in cereals
- Revised "Contaminated grain" sections in all grains
- Revised "Fertilizer pellet" sections in all grains
- Revised "Stone" sections in all grains
- Revised "Treated seeds and other chemical substances" section in all grains
- Inclusion of use of hand sieves in HVK assessment procedures.
- Clarification on assessment of sprouted rye and triticale removed in cleaning
- Select barley charts clarified to show "sample grades" when specifications for standard select are not met
- Addition of fusarium damage procedure for triticale
- Revised colour assessment procedure for canola
- Clarification of broken assessment in solin
- Clarification in yellow mustard of other distinctly detrimental seeds
- Inclusion of spiral cleaner procedures for yellow mustard
- Revised charts and procedures for feed peas
- Clarification of assessment of heated CCFM
- Clarification that rotted corn is treated as heated
- Clarification regarding cutting beans for damage assessment
- Revised description of rancid in soybeans
- Clarification that green seed are removed prior to colour assessment in chick peas

1. Determining test weight

Test weight is the weight of a measured volume of grain expressed in kilograms per hectolitre.

Samples are graded *Sample Account Light Weight* only if the test weight is lower than the minimum established for that class of grain and in accordance with the Order of Precedence as stated in the *Glossary*.

Except for corn, test weight is determined on a cleaned sample—after the removal of dockage following cleaning procedures described for each class of grain.

Note: Test weight is determined on corn prior to removal of cracked corn and foreign material. At country elevators in eastern Canada, test weight is determined after the removal of dockage.

Procedures

1. Fill the Ohaus measure to overflowing with the grain to be tested.
2. Pour the contents of the measure, plus an extra handful, into the funnel.
3. Place the measure on a solid base.
4. Position the funnel on top of the measure.
5. Remove the slide so that the grain drops into the measure.
6. Remove the funnel.

▲ Important: As you remove the funnel, be careful not to disturb the grain in the measure.

7. Using three equal zigzag movements with the striker held at an angle of approximately 45°, level the grain.
8. Pour the grain into the scale pan.
9. Determine the weight of the grain in the scale pan.

The system calculates the weight of the grain, in kilograms per hectolitre (kg/hL).

Equipment used in determining test weight

Equipment	Description
Ohaus 0.5 litre measure	This measure has an inside diameter of approximately 9 cm and a height of approximately 7.75 cm. The measure is calibrated to contain 500 ml of water, ± 1 mL, at 20°C.
Cox funnel	Use a funnel with a 3.81 cm opening and a drop of 4.41 cm from the opening in the funnel to the top of the measure.
Striker	A piece of round hardwood, 1.9 cm in diameter.
Scale	An approved scale, weighing in grams, is used to determine the weight of the grain, in grams, measured in the Ohaus 0.5L measure.
Computer interface	The electronic scale connects to a computer which calculates the test weight in kilograms per hectolitre from the grams in the 0.5 L Ohaus measure. If this is not available use the test weight conversion charts.
Test weight conversion charts	Use these to convert the measurement from the Ohaus measure to kg/hL.

2. Moisture testing

Introduction to moisture testing	2-2
Calibrating the model 919/3.5" moisture meter	2-3
Procedures for determining moisture content.....	2-4
Weigh the sample	2-4
Prepare the meter.....	2-4
Measure temperature	2-4
Take a reading.....	2-4
Determine the moisture content	2-5
Choosing a conversion table	2-6
Estimating moisture content for lightweight wheat, oats and barley samples	2-8
CWRS wheat, oats, and barley	2-8
Other wheats	2-8
Estimating the moisture content of high moisture samples	2-10
Estimating moisture content for beans with no conversion tables	2-11
Adzuki beans	2-11
Dutch brown beans	2-11
Eastern white kidney beans	2-11
Great northern white beans	2-11
Kintoki beans	2-11
Light red kidney beans	2-11
Otebo beans	2-11
Pink beans	2-11
Small red beans	2-11
Determining moisture content for special cases	2-12
Optional analysis	2-12
Corn	2-12
Maintaining meters	2-13
General maintenance and testing procedures	2-13
Bi-weekly check tests	2-13

Introduction to moisture testing

Moisture testing means analyzing a grain sample for the percentage of moisture contained in it.

Moisture content can change the test weight and the appearance of the grain. Grain that is too moist will also begin to deteriorate.

Instructions for moisture testing are issued by the Grain Research Laboratory (GRL).

- Moisture tests are performed on samples free of dockage.
- Industry Services uses the Model 919/3.5" moisture meter for all official moisture testing. The GRL has conversion tables to use with the moisture meter. These tables convert the temperature of the sample and the reading on the moisture meter to percentage moisture in the sample.

Calibrating the model 919/3.5" moisture meter

- If you are testing samples continuously, check the calibration at least every 10 minutes.
- If you are testing samples intermittently, check the calibration before each sample.

1. Move the On-Off switch to On.
2. Turn the function knob to Cal (calibrate).
3. Turn the large knob on the right side of the meter until the dial reading 53 is directly beneath the hairline.

Dial reading 53 has a red arrow marked Cal.

Note: For sunflower seed, safflower seed and lightweight oats use dial reading 73

4. Rotate the small knob on the left side of the meter until the meter needle reaches the lowest possible position on the left side of the meter scale.
5. Turn the function knob to Op (operate).

Procedures for determining moisture content

Weigh the sample

1. Ensure the sample is free of dockage.
2. Ensure the scale is accurate. The accuracy of scales is verified at the beginning of each shift using the appropriate known weights.
3. Weigh the sample. See the chart, *Choosing a conversion table*, on pages 2-6 and 2-7, to determine the size of the sample.

Prepare the meter

4. Calibrate the meter. See *Calibrating the model 919/3.5" moisture meter*, on page 2-3.
5. Set the function knob to Op.

Measure temperature

6. Place a weighed and cleaned sample of grain in the warm-up container or dump cylinder.
7. Insert the thermometer into the grain sample in the warm-up container or dump cylinder.

▲ Important: Make sure that the bulb of the thermometer does not touch the container walls.

8. Wait one to three minutes for the thermometer to stabilize.
9. Record the temperature of the grain sample.

If the temperature is ...	then ...
From 11°C to 30°C	Determine the moisture content.
Under 11°C or over 30°C	<ol style="list-style-type: none"> 1. Keep the sample in an airtight container until the temperature is from 11°C to 30°C 2. Recheck the temperature.

Take a reading

10. Place the loaded dump cylinder on the measuring cell.
11. Push the release button, which lets the sample dump into the test cell.
12. Remove the empty dump cylinder from the measuring cell.

▲ Important: If grain touches the inverted cone portion of the cell post in the measuring cell, the sample is probably light weight, and the meter reading will not be accurate. See *Estimating moisture content for lightweight wheat, oats and barley samples* on page 2-8.

13. Turn the dump cylinder over, to prepare it for the next sample.
14. Rotate the large knob on the right side of the moisture meter until the meter needle reaches the lowest position on the left of the meter scale.
15. Record the dial reading directly beneath the hairline, to the nearest 0.5 of a division.

**Determine
the moisture
content**

16. Use the conversion tables to determine the percentage of moisture.

If . . .	then . . .
The reading is higher than those in the conversion table.	See <i>Estimating moisture content for high moisture samples</i> .
The moisture content of the sample is plus or minus 0.5 percentage units of the straight, tough, damp, moist or wet tolerance. For example, the tolerance for straight grades of wheat is 14.5%. If the moisture content of the wheat sample is 14.0% or higher, follow this procedure.	See <i>Conversion tables table for use with Model 919/3-.5 moisture meter</i> . 1. Retest the sample on another meter. 2. If the two meters do not agree, test again on a third meter.
The supervising inspector thinks additional testing is required.	1. Place the sample in an airtight container. 2. Send the sample to your Regional Head Office for retesting.

Choosing a conversion table

The chart on the next two pages outlines the conversion table to use with each type of grain and lists the representative portion required to determine the moisture content of the sample.

Conversion tables are not available for all grains.

- For wheat, oats and barley samples with low test weight, see *Estimating moisture content for lightweight wheat, oats and barley samples* on page 2-8.
- For samples with high moisture, that is, with values above the range of the conversion table, see *Estimating moisture content for high moisture samples* on page 2-10.
- For beans for which there are no conversion charts, see *Estimating moisture content for beans with no conversion table* on page 2-11.
- For other grains, see *Determining moisture content for special cases* on page 2-12.

Conversion tables for use with the Model 919/3.5" moisture meter

Grain	Weight (g)	Conversion table number	Tough (%)	Damp (%)
Wheat				
CWRS	250	66 kg/hL and over—10	14.6–17.0	over 17.0
lightweight	225	less than 66 kg/hL—9		
CWES	250	2	14.6–17.0	over 17.0
CWSWS, CESWS	250	3	14.6–17.0	over 17.0
CWRW	250	5	14.6–17.0	over 17.0
CEWW	250	5	14.6–17.0	over 17.0
CER	250	1	14.6–17.0	over 17.0
CERS	250	1 CERS	14.6–17.0	over 17.0
CEHRW	250	1 CEHRW	14.6–17.0	over 17.0
CESRW	250	1 CESRW	14.6–17.0	over 17.0
CWAD, CEAD	250	4	14.6–17.0	over 17.0
CPSR, CPSW	250	1	14.6–17.0	over 17.0
Oats	200	6	13.6–17.0	over 17.0
Oats lightweight	140	less than 48 kg/hL (calibrate at 73) Temporary	13.6–17.0	over 17.0
Barley				
Select	225	52 kg/hL or over—13	13.6–17.0	over 17.0
General purpose	225	52 kg/hL or over—13	14.9–17.0	over 17.0
lightweight	200	under 52 kg/hL—10		
Hulless	225	1	14.9–17.0	over 17.0
Rye	250	5	14.1–17.0	over 17.0

Conversion tables for use with the Model 919/3.5" moisture meter (continued)

Grain	Weight (g)	Conversion table number	Tough (%)	Damp (%)
Flaxseed and solin	225	6	10.1–13.5	over 13.5
Canola and rapeseed	250	5	10.1–12.5	over 12.5
Mustard seed, all classes	250	brown mustard—8 oriental mustard—7 yellow mustard—6	9.6–12.5	over 12.5
Peas, green and yellow	250	2	16.1–18.0	over 18.0
Split peas, green and yellow	250	1	16.1–18.0	over 18.0
Chick peas	250	1	14.1–16.0	over 16.0
Pea beans	250	2	no tough	over 18.0
Lentils	250	1	14.1–16.0	over 16.0
Beans				
Black	250	1	no tough	over 18.0
Cranberry	225	1	no tough	over 18.0
Faba	250	2	16.1–18.0	over 18.0
Dark red kidney	250	1	no tough	over 18.0
Pinto	250	1	no tough	over 18.0
Buckwheat	225	3	16.1–18.0	over 18.0
Triticale	250	1	14.1–17.0	over 17.0
Mixed grain	Use the conversion table and tough and damp ranges for the predominant grain.			

Grain	Weight (g)	Conversion table number	Tough (%)	Damp (%)	Moist (%)	Wet (%)
Corn	250	to 20.0—6				
	175	20.0–35.0—11A (used with 11B, Corn Test Weight Adjustment Table)	15.6–17.5	17.6–21.0	21.1–25.0	over 25.0
Soybeans	200	12.0% and over—7	14.1–16.0	16.1–18.0	18.1–20.0	over 20.0
	250	under 12.0%—6				
Sunflower seed	150	3 (calibrate at 73)	9.6–13.5	13.6–17.0	17.1–22.0	over 22.0
Safflower seed	150	1 (calibrate at 73)	9.6–13.5	13.6–17.0	17.1–22.0	over 22.0

Estimating moisture content for lightweight wheat, oats and barley samples

Use these procedures for lightweight wheat, oats and barley samples.

- Canada Western Red Spring (CWRS) wheat is light weight if it is less than 66 kg/hL or 320 g/0.5 L.
- Oats are lightweight if its test weight is less than 48 kg/hL or 220 g/0.5 L.
- Barley is lightweight if its test weight is less than 52 kg/hL or 250 g/0.5 L.
- Samples of wheat, oats and barley are also considered lightweight if grain touches the surface of the inverted cone portion of the cell post in the measuring cell.

Normal procedures for determining moisture content will give inaccurate results with these samples.

CWRS wheat, oats and barley Conversion tables are available for lightweight Canadian Western Red Spring, oats and barley. See *Choosing a conversion table*.

Other wheats These are the procedures for estimating the moisture content of lightweight samples of Canada Western Soft White Spring (CWSWS), Canada Western Red Winter (CWRW), and Canada Western Amber Durum (CWAD), Canada Western Extra Strong (CWES), and Canada Prairie Spring Red or Canada Prairie Spring White (CPSR and CPSW) wheat.

1. Use a 225-g sample with the appropriate temperature.
2. Determine the moisture using Moisture Conversion Table No. 9 (Canada Western Red Spring wheat, test weight less than 66 kg/hL).
3. Subtract or add depending upon the correction factor for the appropriate class by moisture range according to the following table.

Correction factors

Moisture range (%)	CWSWS ¹	CWRW ²	CWAD ³	CWES ⁴	CPSR/CPSW ⁵
10.0 - 12.0	+0.3	-0.1	-0.4	-0.2	0.2
12.1 - 14.0	+0.1	-0.3	-0.6	-0.3	0.0
14.1 - 16.0	0.0	-0.5	-0.8	-0.4	-0.3
16.1 - 18.0	-0.1	-0.6	-0.9	-0.5	-0.5
18.1 - 20.0	-0.2	-0.8	-1.1	-0.6	-0.7

¹ Canada Western Soft White Spring

⁴ Canada Western Extra Strong

² Canada Western Red Winter

⁵ Canada Prairie Spring Red/White

³ Canada Western Amber Durum

Example

Step	Example
1. Use a 225-g sample with the appropriate temperature.	1. A 225-g sample of light weight CWSWS wheat gives a meter reading of 40.0 at 15°C.
2. Determine the moisture using Moisture Conversion Table No. 9 (Canada Western Red Spring wheat, test weight less than 66 kg/hl).	2. Conversion Chart No. 9 (CWRS wheat, test weight less than 66 kg/hl) gives a percentage moisture of 16.2.
3. Add or subtract the correction factor from the chart for the appropriate class according to the moisture range.	3. The correction factor from the Correction factors table is -0.1. The corrected moisture for the light weight sample is (16.2 - 0.1) or 16.1%.

Estimating the moisture content of high moisture samples

If the moisture meter dial reading on a sample is higher than those on the moisture conversion table, use the following procedure to estimate moisture content.

1. Accurately, to two decimal places, weigh a sample larger than the quantity required for testing according to the appropriate sample weight on pages 2-6 and 2-7.

For example, for CWRS, use 300 g, not 250 g.

2. Spread the sample on paper and let it dry at room temperature.
3. Reweigh the sample.
4. Calculate the percentage weight loss.

A = original sample weight

B = sample weight after air drying

C = percentage loss in weight during drying

$$\frac{(A-B) \times 100}{A} = C$$

Percentage loss in weight during air drying = 100

5. Mix the sample thoroughly.
6. Weigh out the amount required for a meter test.
7. Determine the temperature of the sample.
8. Follow the procedures on page 2-4 to determine the moisture content. (=D)
9. Determine the total moisture content of the sample using the following formula.

C = percentage by weight of moisture loss on air drying (step 4)

D = Moisture content determined by meter (step 8)

$$\text{Percentage moisture by weight} = \left[(100-C) \times \frac{D}{100} \right] + C$$

10. Report the result to the nearest 0.1%.

Estimating moisture content for beans with no conversion tables

For beans, the damp moisture range is over 18%.

- | | |
|-----------------------------------|--|
| Adzuki beans | <ol style="list-style-type: none"> 1. Using a Boerner-type divider, divide a 250-g representative portion. 2. Determine moisture content using Cranberry Bean Conversion Table No.1. 3. Subtract 2.5 from the table result. |
| Dutch brown beans | <ol style="list-style-type: none"> 1. Determine sample size and moisture content from Pea Bean Conversion Table No. 2. 2. Subtract 1.1 from the table result. |
| Eastern white kidney beans | Use the Dark Red Kidney Bean Conversion Table No. 1 to determine the size of the representative portion and the moisture content. |
| Great northern white beans | <ol style="list-style-type: none"> 1. Determine sample size and moisture content from Pea Bean Conversion Table No. 2. 2. Subtract 1.4 from the table result. |
| Kintoki beans | Use Dark Red Kidney Bean Conversion Table No. 1 to determine the size of the representative portion and the moisture content. |
| Light red kidney beans | Use the Dark Red Kidney Bean Conversion Table No. 1 to determine the size of the representative portion and the moisture content. |
| Oteba beans | <ol style="list-style-type: none"> 1. Determine sample size and moisture content from Pea Bean Conversion Table No. 2. 2. Subtract 0.3 from the table result. |
| Pink beans | <ol style="list-style-type: none"> 1. Determine sample size and moisture content from Pea Bean Conversion Table No. 2. 2. Subtract 1.1 from the table result. |
| Small red beans | <ol style="list-style-type: none"> 1. Divide a sample of 250 g. 2. Use the following regression formula, where |

T = sample temperature ($^{\circ}\text{C}$):

$\% \text{ moisture} = 0.155 \times \text{meter reading} + 8.03 + \{0.1 \times (22 - T)\}$

Example

The Pea Bean Conversion Table No. 2 shows a sample of 250 g is required.

A sample of great northern white beans shows a meter reading of 25 at 18°C . According to the table, the moisture content for pea beans at this reading is 13.6%.

To adjust this moisture content for great northern white beans, subtract 1.4

The moisture content of the great northern white beans is $13.6 - 1.4$, or 12.2.

Determining moisture content for special cases

Optional analysis

An optional analyses is the process of determining the weight and grade of grain which would otherwise be assessed as dockage. If a sufficient quantity of grain is available, a moisture test will be done on all grains assigned a grade as part of the optional analysis.

When the grain assigned a grade as part of the optional analysis is not large enough for official moisture testing, and most of the sample is tough, damp, moist or wet, the optional analysis portion is graded tough, damp, moist, or wet without reference to a specific moisture content.

Corn

See *Determination of dockage* for corn.

1. Remove foreign material and cracked corn.

If the moisture content is . . .	Use this sieve . . .
25.0% or less	No. 12 round-hole
25.1% or more	No. 14 round-hole

2. Choose the appropriate sample size by weight.

If the moisture content is . . .	Use a sample size of . . .
under 20.0%	250 g
from 20.0% to 35.0%	175 g

3. Choose the conversion table.

If the moisture content is . . .	Use conversion table . . .
20.0% or less	6
from 20.1% to 35.0%	11A—to estimate moisture content based on the dielectric reading and the temperature of the corn 11B—to adjust the preliminary moisture value according to the test weight of the corn sample (Table 11B increases the accuracy of the moisture test.)

Maintaining meters

General maintenance and testing procedures

To help ensure that meters are accurate, follow these general maintenance and testing procedures.

- Do not interchange test cells between meters. The cell and meter are calibrated together. Interchanging them can cause errors.
- Keep the cell clean.
- Verify the calibration of the meter at least every 10 minutes.
- If grain has visible moisture on its surface, store it in a plastic container at room temperature until the moisture is absorbed.
- Treat the meter gently.

Bi-weekly check tests

Every two weeks, a sample of Canadian Western Red Spring (CWRS) wheat with a different moisture content is sent to each CGC location. These samples are used to monitor the precision of the moisture meters.

When you receive the check sample,

1. Open the sealed sample envelope.
2. Place the thermometer inside and close the envelope to avoid moisture loss from the sample.
3. Determine and record the temperature of the sample.
4. Weigh out the appropriate sample portion.
5. Take three dial readings.
6. Record the readings and sample temperature in the template file for the appropriate region on N:\bwallis\[region]\.
 - If results are not within the CGC specifications of $\pm 0.2\%$ moisture, the GRL sends another sample. To recheck the results
 1. Repeat steps 1 to 5.
 2. Send recheck results to

Phone (204) 983-3331
Fax (204) 983-0724
Email bwallis@grainscanada.gc.ca
 - If a meter is found to be inaccurate, the GRL notifies Industry Services to send the meter to Winnipeg for servicing.

3. Specifications for sieves

This table lists the sieves to be used to assess dockage and grading factors.

Sieves for assessing dockage and grading factors

Type	Sieve name	Hole size (millimetres)	Manufacturer's designation (inches)
Round-hole	No. 4.5	1.79	4½/64
	No. 5	1.98	5/64
	No. 5.5	2.18	5½/64
	No. 6	2.38	6/64
	No. 6.5	2.58	6½/64
	No. 7	2.78	7/64
	No. 7.5	2.98	7½/64
	No. 8	3.18	8/64
	No. 8.5	3.37	8½/64
	No. 9	3.57	9/64
	No. 10	3.97	10/64
	No. 11	4.37	11/64
	No. 12	4.76	12/64
	No. 14	5.56	14/64
	No. 15	5.95	15/64
	No. 16	6.35	16/64
	No. 17	6.75	17/64
	No. 18	7.14	18/64
	No. 20	7.94	20/64
	No. 21	8.33	21/64
	No. 22	8.73	22/64
	No. 24	9.52	24/64

Sieves for assessing dockage and grading factors

Type	Sieve name	Hole size (millimetres)	Manufacturer's designation (inches)
Slotted	No. 4.5	1.79 x 12.70	4 1/2/64 x 1/2
	No. 5	1.98 x 19.05	5/64 x 3/4
	No. 6	2.38 x 19.05	6/64 x 3/4
	No. 8	3.18 x 19.05	8/64 x 3/4
	No. 9	3.57 x 19.05	9/64 x 3/4
	No. 11	4.37 x 19.05	11/64 x 3/4
	No. 12	4.76 x 19.05	3/16 x 3/4
	No. 3	1.19 x 7.94	3/64 x 5/16
	No. .064	1.60 x 9.53	0.064 x 3/8
	No. .028	0.71 x 11.90	0.028 x 15/32
	No. .032	0.81 x 11.90	0.032 x 15/32
	No. .035	0.89 x 11.90	0.035 x 15/32
	No. .038	0.96 x 11.90	0.038 x 15/32
	No. .040	1.02 x 11.90	0.040 x 15/32
Buckwheat	No. 5	triangle with 1.98-mm inscribed circle	triangle with 0.078-inch inscribed circle
	No. 6	triangle with 2.26-mm inscribed circle	triangle with 0.089-inch inscribed circle
Wire	No. 3 x 16	3 x 16 mesh per 25.4 mm	3 x 16 wire mesh per inch
	No. 4 x 14	4 x 14 mesh per 25.4 mm	4 x 14 wire mesh per inch
	No. 10 x 10	10 x 10 mesh per 25.4 mm	10 x 10 wire mesh per inch
	No. 9 x 9	9 x 9 mesh per 25.4 mm	9 x 9 wire mesh per inch

4. Wheat

Classes and varieties	4-3
Determination of commercially clean	4-5
Export ready	4-6
Not ready for export	4-6
Determination of dockage	4-7
Definitions	4-7
Dockage not reported	4-7
Normal cleaning procedures	4-7
Composition of dockage	4-8
Cleaning for grade improvement	4-8
Optional analysis	4-10
Grading	4-11
Important definitions	4-11
Net weight of sample	4-11
Kernel counts	4-11
Hazardous substances in samples	4-11
Representative portion for grading	4-11
Grading factors	4-13
Artificial stain	4-13
Binburnt kernels	4-13
Blackpoint	4-13
Broken	4-14
Common bunt (stinking smut)	4-14
Contaminated grain	4-14
Contrasting classes	4-14
Dark immature kernels	4-15
Degermed kernels	4-15
Earth pellets	4-15
Ergot	4-15
Excreta	4-15
Fertilizer pellets	4-15
Fireburnt kernels	4-16
Foreign material	4-16
Fusarium damage	4-16
Grass green kernels	4-16
Grasshopper or army worm damage	4-17
Hard vitreous kernels	4-17
Heated kernels	4-18
Indian meal moth	4-18
Matter other than cereal grains	4-19
Midge damage	4-19
Mouldy kernels	4-19
Natural stain	4-19
Odour	4-20
Other cereal grains	4-20

Other cereal grains and other matter	4-20
Penetrated smudge	4-20
Pink kernels	4-21
Protein	4-21
Red smudge	4-21
Rotted kernels	4-21
Sawfly damage	4-22
Sclerotinia sclerotiorum	4-22
Severe midge damage	4-22
Severely mildewed kernels	4-22
Severely sprouted kernels	4-23
Shrunken and broken	4-23
Smudge	4-24
Soft earth pellets	4-24
Sprouted kernels	4-25
Stones	4-25
Streak mould	4-27
Superficial discolouration	4-27
Treated seed and other chemical substances	4-28
Wheats of other classes or varieties	4-28
Primary grade determinants tables	4-30
Wheat, Canada Western Red Spring (CWRS)	4-30
Wheat, Canada Western Amber Durum (CWAD)	4-32
Wheat, Canada Western Red Winter (CWRW)	4-35
Wheat, Canada Western Soft White Spring (CWSWS)	4-36
Wheat, Canada Western Extra Strong (CWES)	4-38
Wheat, Canada Prairie Spring White (CPSW)	4-40
Wheat, Canada Prairie Spring Red (CPSR)	4-42
Wheat, Canada Eastern Red (CER)	4-44
Wheat, Canada Eastern Red Spring (CERS)	4-46
Wheat, Canada Eastern Hard Red Winter (CEHRW)	4-48
Wheat, Canada Eastern Soft Red Winter (CESRW)	4-50
Wheat, Canada Eastern Amber Durum (CEAD)	4-52
Wheat, Canada Eastern White Winter (CEWW)	4-55
Wheat, Canada Eastern Soft White Spring (CESWS)	4-57
Export shipments	4-58
Commercially clean	4-58
Not commercially clean	4-58
Grading	4-58
Export grade determinants tables	4-59
Wheat, Canada Western Red Spring (CWRS)	4-59
Wheat, Canada Western Amber Durum (CWAD)	4-60
Wheat, Canada Western Red Winter (CWRW)	4-61
Wheat, Canada Western Soft White Spring (CWSWS)	4-62
Wheat, Canada Western Extra Strong (CWES)	4-63
Wheat, Canada Prairie Spring Red (CPSR)	4-64
Wheat, Canada Prairie Spring White (CPSW)	4-65

Classes and varieties

Class name	Grades	Variety (from the Regulations)
Canada Western Red Spring	No. 1 CWRS No. 2 CWRS No. 3 CWRS	Any variety of red spring wheat equal to or better than Neepawa
	CW Feed	Any type or variety of wheat excluding amber durum
Canada Western Amber Durum	No. 1 CWAD No. 2 CWAD No. 3 CWAD No. 4 CWAD	Any variety of amber durum wheat equal to or better than Hercules
	No. 5 CWAD	Any variety of amber durum wheat
Canada Western Red Winter	No. 1 CWRW No. 2 CWRW	Any variety of red winter wheat equal to acceptable reference varieties
	CW Feed	Any type or variety of wheat excluding amber durum
Canada Western Soft White Spring	No. 1 CWSWS No. 2 CWSWS No. 3 CWSWS	Any variety of soft white spring wheat equal to acceptable reference varieties
	CW Feed	Any type or variety of wheat excluding amber durum
Canada Western Extra Strong	No. 1 CWES No. 2 CWES	Any variety of extra strong red spring wheat equal to or better than Glenlea
	CW Feed	Any type or variety of wheat excluding amber durum
Canada Prairie Spring White	No. 1 CPSW No. 2 CPSW	Any variety of Canada Prairie Spring White wheat equal to acceptable reference varieties
	CW Feed	Any type or variety of wheat excluding amber durum
Canada Prairie Spring Red	No. 1 CPSR No. 2 CPSR	Any variety of Canada Prairie Spring Red wheat equal to acceptable reference varieties
	CW Feed	Any type or variety of wheat excluding amber durum

Class name	Grades	Variety (from the Regulations)
Canada Eastern Red	No. 1 CER No. 2 CER No. 3 CER	Any variety of red wheat
	CE Feed	Any type or variety of wheat excluding amber durum
Canada Eastern Red Spring	No. 1 CERS No. 2 CERS No. 3 CERS	Any variety of red spring wheat
	CE Feed	Any type or variety of wheat excluding amber durum
Canada Eastern Hard Red Winter	No. 1 CEHRW No. 2 CEHRW No. 3 CEHRW	Any variety of hard red winter wheat
	CE Feed	Any type or variety of wheat excluding amber durum
Canada Eastern Soft Red Winter	No. 1 CESRW No. 2 CESRW No. 3 CESRW	Any variety of soft red winter wheat
	CE Feed	Any type or variety of wheat excluding amber durum
Canada Eastern Amber Durum	No. 1 CEAD No. 2 CEAD No. 3 CEAD	Any variety of amber durum wheat equal to Hercules
	CE Feed Durum	Any variety of amber durum wheat
Canada Eastern White Winter	No. 1 CEWW No. 2 CEWW No. 3 CEWW	Any variety of white winter wheat equal to acceptable reference varieties
	CE Feed	Any type or variety of wheat excluding amber durum
Canada Eastern Soft White Spring	No. 1 CESWS No. 2 CESWS No. 3 CESWS	Any variety of soft white spring wheat equal to acceptable reference varieties
	CE Feed	Any type or variety of wheat excluding amber durum

Determination of commercially clean

Dockage is not assessed on wheat samples that meet the commercially clean specifications defined in the wheat export grade determinant tables. All samples must be analyzed to determine if they meet commercial cleanliness standards prior to dockage assessment. The analysis of samples which are **clearly** not commercially clean may consist of a visual assessment. For example, if there is no doubt that a sample contains more than 0.05% of small seeds without hand sieving and weighing the seeds then dockage will be assessed using procedures defined under *Determination of dockage*. Where there is any doubt regarding whether the sample is commercially clean, the sample must be analyzed using the procedures outlined below in steps 1 through 13 to confirm that the sample is not commercially clean prior to assessing dockage.

1. Using a Boerner-type divider, divide the sample to obtain a representative portion of at least 900 grams.
2. Place approximately 250 grams of the sample at a time on the No. 5 buckwheat sieve nested over the No. 4.5 round-hole sieve.
3. Move the sieves from left to right 30 times using a sifting motion. One complete motion is approximately 10 cm from the center to one side, back to the center, approximately 10 cm to the other side and back to the center.
4. All broken wheat passing through the No. 5 buckwheat hand sieve or the No. 4.5 round hole sieve is weighed and the percentage calculated to determine if it meets the commercially clean specification of the grade for broken through a No. 5 buckwheat sieve. (Column #1 in the wheat export grade determinant tables)
5. Small seeds passing the No. 4.5 round hole sieve are weighed and the percentage calculated to determine if they meet the commercially clean specification of the grade for small seeds. (Column #2 in the wheat export grade determinant tables)
6. Material other than broken grain and small seeds passing through the 4.5 round hole sieve is weighed and the percentage calculated to determine if it meets the commercially clean specification of the grade for attrition. (Column #3 in the wheat export grade determinant tables)
7. The sample portions remaining on top of the No. 5 buckwheat sieve and the 4.5 round hole sieve are recombined and divided using a Boerner-type divider to a representative portion of not less than 250 grams.
8. The portion divided from step 7 is handpicked to remove large seeds (as defined in the *Glossary*), roughage and wild oats.
9. The roughage material is weighed and the percentage calculated to determine if it meets the commercially clean specification of the grade for roughage. (Column #4 in the wheat export grade determinant tables)
10. The percentages of small seeds, attrition and roughage are added together to determine if the total meets the commercially clean specification of the grade for total small seeds, attrition and roughage. (Column #5 in the wheat export grade determinant tables)

11. The large seeds are weighed and the percentage calculated to determine if they meet the commercially clean specification of the grade for large seeds. (Column #6 in the wheat export grade determinant tables)
12. The wild oats are weighed and the percentage concentration calculated to determine if they meet the commercially clean specification of the grade for wild oats. (Column #7 in the wheat export grade determinant tables)
13. The percentages of small seeds, large seeds, and wild oats are added together to determine if the total meets the commercially clean specification of the grade for total small seeds, large seeds and wild oats. (Column #8 in the wheat export grade determinant tables)

Should the percentage concentration of any of the factors determined in steps 1 through 13 exceed the specifications set out in columns #1 through #8 of the wheat export grade determinant tables the sample will be considered to be not commercial clean. Dockage will be assessed on samples determined to be not commercially clean using the procedures defined in *Determination of dockage*.

Note: Large seeds, small seeds, roughage and attrition are defined in the *Glossary*.

**Export ready
(ER)**

Export ready carlots must meet the following criteria:

1. The lot must meet the commercially clean specifications for the grade.
2. Wheats of other classes and contrasting classes must meet the export specifications for the grade.
3. Total foreign material must meet the export specifications of the grade.

**Not ready
for export
(NRE)**

Not export ready refers to carlots which are commercially clean but do not meet the export specifications for either wheats of other classes, contrasting classes or total foreign material.

Determination of dockage

Definitions Dockage is assessed to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as “any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain.” Dockage is removed by following the cleaning procedures described in this chapter.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage is assessed in two stages.

1. Follow *Normal cleaning procedures*, using the Carter dockage tester.
2. Follow procedures for *Cleaning for grade improvement*. This cleaning can be done at any time after normal cleaning has been completed.

Dockage not reported

▲ **Important:** Dockage is not reported for samples grading

- *Wheat, Sample CW/CE/CAN Account Fireburnt*
- *Wheat, Sample Salvage*
- *Wheat, Sample Condemned*

For *Wheat, Sample CW/CE/CAN Account Admixture*, dockage is not reported for removable material similar in nature to the admixture.

Normal cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

1. Set up the Carter dockage tester with the following specifications.

Feed control	#6
Air control	Minimum #4 (increase according to the nature of the material)
Riddle	No. 25
Top sieve	No. 6 buckwheat
Centre sieve	No. 5 buckwheat
Bottom sieve	No. 5 buckwheat
Sieve cleaner	Off

2. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
 - Official samples should be at least 900 g.
 - Unofficial samples should be at least 750 g.
3. Turn on the Carter dockage tester.
4. Pour the sample into the hopper.
5. After the sample has passed through the machine, turn on the sieve cleaner control for 2 to 3 seconds to remove kernels lodged in the sieve.
6. Turn off the dockage tester.
7. Lightly snap the retainer rod of the aspiration pan to loosen material gathered on the air screen.
8. Remove the aspiration pan.
9. Handpick whole sound threshed kernels of wheat from the portion passing over the riddle and return them to the cleaned sample.

Composition of dockage

Dockage includes

- Wheat with long rootlets, unthreshed wheat heads, and material other than wheat removed by the No. 25 riddle
- Material removed by No. 5 buckwheat sieve in the lower position
- Material removed by aspiration
- A maximum of 10% of soft earth pellets handpicked from the clean sample.
- Material removed by *Cleaning for grade improvement*

Cleaning for grade improvement

If the grade of a sample can be improved by additional cleaning, perform the cleaning and add the additional material to dockage. Cleaning for grade improvement can be done at any time after normal cleaning.

The purpose of this cleaning is not to remove all foreign material, but rather to reduce the admixture of conspicuous separable material to within the grade tolerance.

1. After normal cleaning, examine the material to be removed and select your equipment according to that material. See the table, *Cleaning for grade improvement*, for the list of equipment.
2. Pass the sample through the Carter dockage tester, or sieve the sample by hand, depending on the material.
 - ▲ **Important:** When you use a hand sieve, move the sieve from left to right 30 times, using a sifting motion. One time is one complete motion from the centre, to one side, to the other side, and back to the centre. The total distance from left to right is 20 cm, or about eight inches.
3. Weigh the additional dockage and add it to the original dockage.

Cleaning for grade improvement—Wheat

Material to be removed	Equipment	Composition of dockage
Broken kernels	No. 6 buckwheat hand sieve No. 10x10 wire hand sieve	<p>If the weight of broken kernels in the cleaned sample is over the grade tolerance, you can remove up to 5.0% of the gross weight in broken kernels to improve the grade.</p> <p>For example, if a sample of CWRS contains 12% broken kernels by gross weight, you can remove enough broken kernels to bring the percentage to 7%, which brings the sample within the grade tolerance for No. 3 CWRS. Add the maximum 5% broken kernels to dockage.</p> <p>See <i>Shrunken and broken</i>.</p>
Bunt balls	Carter dockage tester, using the setup for <i>Normal cleaning procedures</i> , but with air control at a maximum setting of 7	<p>If there is no odour, remove bunt balls and add to dockage. If there is an odour, bunt is a grading factor.</p> <p>See <i>Common bunt</i>.</p>
Foreign material, such as cockle, oat groats, or rye grass	No. 6 buckwheat hand sieve No. 10x10 wire hand sieve	Add material to dockage, if the grade is improved as a result.
Stones	No. 6 buckwheat hand sieve	<p>If the weight of stones and other material removed is</p> <ul style="list-style-type: none"> • 5.0% or less of the gross weight, assess as dockage. • More than 5.0% of the gross weight, see <i>Stones</i> in Grading factors, or the relevant grade determinants table.
Wild oats	Carter dockage tester, using the setup for <i>Normal cleaning procedures</i> , but with No. 1 riddle No. 10x10 wire hand sieve	Everything removed is dockage.

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal or transfer elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported and elevator stocks will be adjusted on the basis of the analysis. Agreement of the shipper and unload elevator must be conveyed to the CGC in writing prior to the analysis being performed.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
 - The percentage by gross weight to the nearest 0.1% and the grade of wheat.
 - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
 - The percentage of dockage.

Example

95.0% Wheat, No. 1 CWRS

4.0% Domestic Mustard Seed, No. 1 CAN Oriental

1.0% dockage

Grading

Important definitions

Net weight of sample	The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the cleaned sample, or the net weight.
Kernel counts (K)	<p>A kernel count is the number of kernel-sized pieces in 500 gram sample.</p> <ul style="list-style-type: none"> • To do kernel counts, you must have 500 g of cleaned sample. • All grading is done on representative portions divided down from the cleaned sample using a Boerner-type divider.
Hazardous substances in sample	Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide or dessicant".

Representative portion for grading

All grading is done on representative portions divided down from the cleaned sample, using a Boerner-type divider.

When the concentration of the grading factor is . . .	Then use . . .
Low	Optimum portion
High	Minimum portion or more (do not use less)

Values in the table on the next page represent a range of recommended portions of samples for grading.

Representative portion of wheat for grading, grams

Grading factor	Minimum	Optimum	Export
Artificial stain	250	500	500
Binburnt kernels	100	1000	1000
Blackpoint	25	50	50
Common bunt	50	100	100
Dark immature kernels	50	100	100
Degermed kernels	25	50	50
Ergot	500	1000	1000
Excreta	working sample	working sample	working sample
Fireburnt	500	working sample	working sample
Fusarium damage	10	100	100
Grasshopper, armyworm damage	50	100	100
Grass green kernels	50	100	100
Hard vitreous kernels, sieving	250	250	250
Hard vitreous kernels, handpick	15	25	25
Heated	25	250	500
Matter other than cereal grains	50	100	250
Mouldy	100	1000	1000
Natural stain	50	100	100
Odour	working sample	working sample	working sample
Other cereal grains	25	100	250
Other cereal grains and other matter	—	—	250
Penetrated smudge	100	500	500
Pink kernels	50	100	100
Red smudge	100	500	500
Rotted	100	1000	1000
Sawfly, midge damage	50	100	100
Sclerotinia	500	1000	1000
Severe midge damage	25	100	100
Severely mildewed	100	1000	1000
Severely sprouted	50	100	100
Shrunken and broken	250	250	250
Smudge	100	500	500
Soft earth pellets	working sample	working sample	working sample
Sprouted kernels	10	100	100
Stones	500	1000	1000
Superficial discolouration	working sample	working sample	working sample
Wheats of other classes or varieties	15 to 50	25 to 100	25 to 100

Grading factors

Artificial stain (ART STND)

- ▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

Artificial stain

- Includes any nontoxic stain on kernels caused by contact with foreign substances such as dye, oil, grease, paint, or soot
- Does not include any stain considered a natural stain
- Does not include any stain caused by coming into contact with poisonous substances, or any stain that could be considered *Contaminated grain*

Representative portion for analysis

Minimum—250 g

Optimum—500 g

Export—500 g

Procedures

- If the amount of stain is not excessive, determine the kernel count.
- If the amount of stain seems excessive, determine the weight of stained kernels as a percentage of the net weight of the sample.

- ▲ **Important:** If you are uncertain about the identity of the stain, treat the sample as *Contaminated grain*.

Binburnt kernels (BBT)

Binburnt kernels are blackened as a result of severe heating in storage. A cross section of a binburnt kernel is smooth and glossy. A binburnt kernel is similar in weight to a sound kernel.

There is a single tolerance for the total of binburnt, severely mildewed, mouldy, and rotted kernels.

Representative portion for analysis

Minimum—100 g

Optimum—1000 g

Export—1000 g

Procedures

- If the number of binburnt kernels is not excessive, determine the number of kernels in 1000 g.
- If the kernel count is excessive, determine the weight of binburnt as a percentage of the net weight of the sample.

Blackpoint (BLK PT)

Kernels with blackpoint have a distinct dark brown or black discolouration of the whole germ and surrounding area.

Representative portion for analysis

Minimum—25 g

Optimum—50 g

Export—50 g

Procedures

- Disregard a slight discolouration restricted to the germ.
- When the discolouration affects more than one-half of the kernel or extends into the crease, it is considered smudge.

In assessing blackpoint

- Depending on the severity of the discolouration and the overall quality of the sample, established tolerances may be exceeded at the inspector's discretion.

**Broken
(BKN)**

Broken kernels are pieces of wheat that are less than three-quarters of a whole kernel. If the piece is more than three-quarters of a kernel, it is considered whole.
See *Shrunk and broken*

**Common bunt
(stinking smut)
(SMUT)**

Common bunt is a plant disease caused by fungi, characterized by

- Soft black bunt balls
- Kernels tagged with black bunt spores
- A distinct smutty odour, or the smell of rotten fish

Representative portion for analysis

Minimum— 50 g

Optimum— 100 g

Export— 100 g

Procedures

See procedures for *Cleaning for grade improvement*.

- If samples have a distinct odour or are heavily infected with non-removable bunt balls, grade *Wheat Sample CW/CE/CAN Account Odour*.
- If kernels are tagged with bunt spores but there is no smutty odour, the sample is *Naturally stained* and graded accordingly.

**Contaminated
grain**

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the "Canada Grain Act" as; "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Wheat, Sample Condemned*.

**Contrasting
classes
(CON CL)**

See *Wheats of other classes or varieties (WOOC)*

Dark immature kernels (DKIM)	Dark immature kernels are also called swath-heated kernels. They are similar to heated kernels, but they do not exhibit the reddish discolouration associated with heated kernels, and they do not have a heated odour.		
Representative portion for analysis			
Minimum—50 g	Optimum—100 g	Export—100 g	
Degermed kernels (DGM)	The germ has been removed through the mechanical handling process. Degermed kernels lack the greyish discolouration that is often present with sprouted kernels.		
Representative portion for analysis			
Minimum—25 g	Optimum—50 g	Export—50 g	
Earth pellets (EP)	<ul style="list-style-type: none">• Hard earth pellets are pellets that do not crumble under light pressure. See <i>Stones</i>.• Soft earth pellets are pellets that crumble under light pressure. See <i>Soft earth pellets</i>.		
Ergot (ERG)	Ergot is a plant disease which produces elongated fungus bodies with a purplish black exterior, a purplish white to off-white interior, and a relatively smooth surface texture.		
Representative portion for analysis			
Minimum—500 g	Optimum—1000 g	Export—1000 g	
Procedures			
<ul style="list-style-type: none">• Determine the weight of ergot as a percentage of the net weight of the sample.			
Excreta (EXCR)	▲ Important: Wear gloves and a mask to handle any samples that you suspect may contain excreta.		
Representative portion for analysis			
Minimum—working sample	Optimum—working sample	Export—working sample	
Fertilizer pellets (FERT PLTS)	Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.		
Representative portion for analysis			
Minimum—working sample	Optimum—working sample	Export—working sample	

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Wheat, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction “*Suspect Contaminated Grain, Handling Procedures*” for procedures to be followed when handling samples containing fertilizer pellets.

Fireburnt kernels (FBNT)

Fireburnt kernels are charred or scorched by fire. A cross-section of a fireburnt kernel resembles charcoal with numerous air holes which crumble easily under pressure.

Representative portion for analysis

Minimum—500 g

Optimum—working sample

Export—working sample

Foreign material (FM)

Foreign material is anything that is not wheat that remains in the sample after the removal of dockage.

Fusarium damage (FUS DMG)

Fusarium-damaged wheat is typically characterized by thin or shrunken chalk-like kernels. Fusarium-damaged kernels have a white or pinkish fibrous growth which may be visible only under a magnifying lens.

Representative portion for analysis

Minimum—10 g

Optimum—100 g

Export—100 g

Procedures, for severely infested samples

1. Using a Boerner-type divider, divide the representative portion.
2. Separate all kernels showing any evidence of fusarium damage, including any kernels that have a chalk-like appearance.
3. You may examine kernels using a 10-power magnifying lens to confirm evidence of a white or pinkish mould or fibrous growth. In determining fusarium damage, use only kernels with this white or pinkish mould or growth.

Grass green kernels (GRASS GR)

Grass-green kernels are a distinct vivid green throughout because of immaturity.

Representative portion for analysis

Minimum—50 g

Optimum—100 g

Export—100 g

Grasshopper, army worm damage (GAW)	Kernels damaged by grasshopper or army worm are chewed, usually on the sides.		
	Representative portion for analysis		
	Minimum—25 g	Optimum—100 g	Export—100 g

Hard vitreous kernels (HVK)	Vitreousness is a natural translucent colouring. It is a sign of kernel hardness.		
	Hard vitreous kernels of all types of wheat		
	<ul style="list-style-type: none">• Are whole or broken, reasonably sound kernels that show clear evidence of vitreousness, even though they may be bleached• Include hard vitreous kernels of wheats of other classes that blend		
	Non-vitreous kernels in samples of amber durum		
	<ul style="list-style-type: none">• Have a starch spot of any size• Are damaged—sprouted, binburnt, severely mildewed, rotted, mouldy, heated, fireburnt, showing penetrated smudge, degermed, grass green, severely midge-damaged, or severely frost-damaged• Are of other wheat classes		
	Non-vitreous kernels in samples of red spring and red winter wheats		
	<ul style="list-style-type: none">• Are starchy• Are damaged—sprouted, binburnt, severely mildewed, rotted, mouldy, heated, fireburnt, showing penetrated smudge, degermed, grass green, severely midge-damaged, or severely frost-damaged• Are of contrasting wheat classes		
	For red spring and red winter wheats, use discretion when assigning HVK values to bleached samples. Consider the degree of bleaching and the overall effect on the visual quality of the sample.		
	Representative portion for sieving		
	Minimum—250 g	Optimum—250 g	Export—250 g
Representative portion for handpicking			
Minimum—15 g	Optimum—25 g	Export—25 g	

Procedures

1. Using a Boerner-type divider, divide a representative portion of 250 g from the cleaned sample.
2. Sieve the representative portion mechanically, using the Carter dockage tester or manually using the No. 4.5 slotted sieve.

Feed control	#6
Air control	Off
Riddle	None
Top sieve	No. 4.5 slotted sieve
Centre sieve	Blank tray
Bottom sieve	None
Sieve cleaner	Off

Manual method

Sift the approximately 250 g clean sub-sample over the No. 4.5 slotted hand sieve. Sifting shall consist of 25 complete motions of about 15 cm total distance.

3. From the material that remains on top of the sieve or lodged in the sieve, divide a portion of 15 g, or 25 g for export shipments.

Material that passes through the sieve is not used in the determination of HVK.

4. Separate vitreous and non-vitreous kernels from the 15-g portion.
5. For amber durum only: Cut and examine the endosperm of bleached kernels to determine if they are vitreous.

Heated kernels (HTD)

Heated kernels have the colour and may have the odour typical of grain that has deteriorated in storage or has been damaged by artificial drying. They range from orange-red to very dark brown, but are not black.

Representative portion for analysis

Minimum—25 g

Optimum—250 g

Export—500 g

Indian meal moth (DGM)

Consider kernels showing damage from Indian meal moth as degermed.
See *Degermed*.

Representative portion for analysis

Minimum—25 g

Optimum—50 g

Export—50 g

Matter other than cereal grains (MOTCG)

Matter other than cereal grains is

- Inseparable seeds such as ragweed, Tartary buckwheat, rye grass, and wild oats
- Non-cereal domestic grains such as flaxseed, corn, peas, buckwheat and lentils that remain in the cleaned sample

Representative portion for analysis

Minimum—50 g

Optimum—100 g

Export—250 g

Midge damage (MDGE DMG)

Midge-damaged kernels are distinctly shrunken or distorted. They are characterized by a depression or caved-in side marked by a scarred pericarp. The pericarp is frequently ruptured, exposing the endosperm.

Representative portion for analysis

Minimum—25 g

Optimum—100 g

Export—100 g

Mouldy kernels (MLDY KRNL)

Mouldy kernels are discoloured, swollen and soft as a result of decomposition by fungi or bacteria. They have mould visible to the naked eye and can feel spongy under pressure.

There is a single tolerance for the total of binburnt, severely mildewed, mouldy, and rotted kernels.

Representative portion for analysis

Minimum—100 g

Optimum—1000 g

Export—1000 g

Procedures

For CE wheat

- If the number of mouldy kernels is not excessive, determine the number of kernels in 1000 g.
- If the number of mouldy kernels is excessive, determine the weight of mouldy kernels as a percentage of the net weight of the sample.

For CW wheat

- Determine the weight of mouldy kernels as a percentage of the net weight of the sample
 - If the number of mouldy kernels is not excessive, determine the number of kernels in 1000 g.
-

Natural stain (NSTN)

A natural stain is any stain on kernels caused by contact with natural substances such as bunt spores, soil or weeds.

Representative portion for analysis

Minimum—50 g

Optimum—100 g

Export—100 g

**Odour
(ODOR)**

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour—such as fuel oil, skunk or urea
- The presence of visible residue causing the odour

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

If odour is the grade determinant and there is . . .	Then the grade is . . .
A distinct objectionable odour not associated with the quality of the grain, but not heated or fireburnt	<i>Wheat, Sample CW/CE/CAN Account Odour</i>
A distinct heated odour	<i>Wheat, Sample CW/CE/CAN Account Heated</i>
A distinct fireburnt odour	<i>Wheat, Sample CW/CE/CAN Account Fireburnt</i>

**Other cereal
grains
(OCG)**

Other cereal grains in wheat are rye, barley, triticale, oats, oat groats, and wild oat groats that remain in the cleaned sample. Other cereal grains are treated as total foreign material.

Representative portion for analysis

Minimum—25 g

Optimum—100 g

Export—250 g

**Other cereal
grains and
other matter
(OCGOM)**

Other cereal grains and other matter in the export grade determinant tables refers to cereal grains other than wheat and to inseparable material excluding large seeds, wild oats, stones, mineral matter, ergot and *sclerotinia sclerotiorum*.

Representative portion for analysis

Minimum—250 g

Optimum—250 g

Export—250 g

**Penetrated
smudge
(PENT SM)**

With penetrated smudge, the discolouration penetrates and extends throughout the endosperm, usually as a result of a more severe infection.

Representative portion for analysis

Minimum—100 g

Optimum—500 g

Export—500 g

Procedures

- If the amount of smudge is not excessive, determine the kernel count.
- If the kernel count is excessive, determine the amount of smudge as a percentage of the net weight of the sample.

Pink kernels (PNK)	<p>Pink pigment in wheat kernels is an indication of immaturity. Pink kernels</p> <ul style="list-style-type: none"> • Are usually shrunken • Display a pink discolouration <p>▲ Important: Do not confuse pink kernels with fusarium-damaged kernels, pesticide treated seed or other contaminated grains.</p> <p>Representative portion for analysis</p> <p>Minimum—50 g Optimum—100 g Export—100 g</p>
Protein (PROT)	<p>The classes of CWRS, CWAD, CWES and CWRW wheat have a minimum protein level.</p> <p><i>See Primary grade determinants tables.</i></p>
Red smudge (RSM)	<p>Red smudge is a dark reddish discolouration usually associated with amber durum wheat. It usually affects the entire bran portion of the kernel. Discolouration is not superficial and cannot be removed through abrasion.</p> <p>Representative portion for analysis</p> <p>Minimum—100 g Optimum—500 g Export—500 g</p> <p>Procedures</p> <ul style="list-style-type: none"> • If the amount of smudge is not excessive, determine the kernel count. • If the kernel count is excessive, determine the amount of smudge as a percentage of the net weight of the sample.
Rotted kernels (ROT KRNL)	<p>Rotted kernels are discoloured, swollen and soft as a result of decomposition by fungi or bacteria. They feel spongy under pressure.</p> <p>There is a single tolerance for the total of binburnt, severely mildewed, mouldy, and rotted kernels.</p> <p>Representative portion for analysis</p> <p>Minimum—100 g Optimum—1000 g Export—1000 g</p> <p>Procedures</p> <p>For CE wheat</p> <ul style="list-style-type: none"> • If the number of rotted kernels is not excessive, determine the number of kernels in 1000 g. • If the number of rotted kernels is excessive, determine the weight of rotted kernels as a percentage of the net weight of the sample.

For CW wheat

- Determine the weight of rotted kernels as a percentage of the net weight of the sample.
- If the number of rotted kernels is not excessive, determine the number of kernels in 1000 g.

Sawfly damage (SFLY DMG) Kernels with sawfly damage are shrivelled or distorted.

Representative portion for analysis

Minimum—25 g Optimum—100 g Export—100 g

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a dark black exterior, a pure white interior, and a coarse surface texture.

Representative portion for analysis

Minimum—500 g Optimum—1000 g Export—1000 g

Procedures

- Determine the weight of the rotted kernels as a percentage of the net weight of the sample.

Severe midge damage (SEVMDGE)

Midge damaged kernels that are blackened by moulds are classed as severe midge damage. This discolouration is the result of a secondary fungal infection. Severe midge damage is determined for CWAD only.

Representative portion for analysis

Minimum—25 g Optimum—100 g Export—100 g

Severely mildewed kernels (SEVMIL)

In severely mildewed wheat, mildew spores have severely blackened the kernel inside and out. The kernels feel spongy under pressure.

There is a single tolerance for the total of binburnt, severely mildewed, mouldy, and rotted kernels.

Representative portion for analysis

Minimum—100 g Optimum—1000 g Export—1000 g

Procedures

For CE wheat

- If the number of severely mildewed kernels is not excessive, determine the number of kernels in 1000 g.
- If the kernel count is excessive, determine the weight of severely mildewed kernels as a percentage of the net weight of the sample.

For CW wheat

- Determine the weight of severely mildewed kernels as a percentage of the net weight of the sample.
- If the number of rotted kernels is not excessive, determine the number of kernels in 1000 g.

Severely sprouted kernels (SEVSPTD)

Severely sprouted kernels apply only to CWRS grades. They

- Have sprouts extending beyond the normal contours of the germ
- Are severely degenerated as an apparent result of advanced sprouting

Representative portion for analysis

Minimum—50 g

Optimum—100 g

Export—100 g

Shrunken and broken kernels (SHR, BKN)

Percentages of shrunken and broken kernels are determined from the same representative portion.

Shrunken kernels (SHR)

Shrunken kernels are whole kernels of wheat that pass through a No. 4.5 slotted sieve.

Broken kernels (BKN)

Broken kernels are pieces of wheat that are less than three-quarters of a whole kernel. If the piece is more than three-quarters of a kernel, it is considered whole.

Representative portion for analysis

Minimum—250 g

Optimum—250 g

Export—250 g

Determine the percentage of shrunken kernels

1. Using a Boerner-type divider, divide a representative portion of approximately 250 g from the sample.
2. Pass the portion through the Carter dockage tester set up as follows:

Feed control	#5
Air control	off
Riddle	none
Top sieve	No. 4.5 slotted
Centre sieve	blank tray
Bottom sieve	none
Sieve cleaner	off

3. Handpick broken kernels which pass through the sieve.

Determine the percentage of broken kernels

4. Using a Boerner-type divider and the remaining portion from which the shrunken kernels have been removed, divide a representative portion of approximately 50 g.
5. Handpick broken kernels from the 50-g portion.
6. Add this weight to the weight of the handpicked kernels from Step 3.
7. Determine the percentage by net weight of broken kernels.

Report total shrunken and broken (TSHRBKN)

8. To report total shrunken and broken, round down the reported percentage to a whole number. For example, round 6.9 % to 6.0%.

**Smudge
(SM)**

Smudge is a discolouration on the kernel. The discolouration may be brown, black or red.

- The discolouration is considered smudge if more than one-half the kernel is discoloured, or if the discolouration extends into the crease.
- Less extensive discolouration is considered blackpoint.

Representative portion for analysis

Minimum—100 g

Optimum—500 g

Export—500 g

Procedures

- If the amount of smudge is not excessive, determine the kernel count.
- If the kernel count is excessive, determine the amount of smudge as a percentage of the net weight of the sample.

**Soft earth
pellets
(SEP)**

Soft earth pellets are

- Earth pellets that crumble into fine dust under light pressure, using a finger only— if they do not crumble, they are considered *Stones*.
- Any non-toxic material of similar consistency.

Representative portion for analysisMinimum—working
sampleOptimum—working
sampleExport—working
sample**Procedures**

1. Handpick soft earth pellets from the clean sample.
2. Soft earth pellets constituting 10.0% or less of the sample are assessed as dockage.
3. Where soft earth pellets represent more than 10% of the net weight, the sample is graded *Wheat, Sample Account Admixture*.

Sprouted kernels (SPTD)

Kernels are sprouted if one of the following conditions exists:

- Kernels show clear evidence of growth in the germ area.
- The bran is noticeably split over the germ from apparent growth.
- The germ is missing and there is apparent greyish discolouration normally attributable to sprouting.
- The germ, though intact, appears distinctly swollen as a result of sprouting activity.

▲ Important:

If a kernel has a slightly swollen germ or the bran is split, but there is no apparent sprouting activity, and ...	Then the kernel is ...
If there are no other sprouted kernels in the sample	Sound
If there are other sprouted kernels in the sample	Sprouted

Representative portion for analysis

Minimum—10 g

Optimum—100 g

Export—100 g

Procedures

1. Using a Boerner-type divider, divide a representative portion.
2. Separate all kernels showing any evidence of sprouting.

▲ Important: For CEWW, unless there is clear evidence of growth, do not count the kernel as sprouted.

3. You may use a 10-power magnifying lens to confirm sprouting activity.

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Representative portion for analysis

Minimum—500 g

Optimum—1000 g

Export—1000 g

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

Note: Stones may be removed and included in dockage if the the material removed is 5.0% or less of the gross weight of the sample. See *Cleaning for grade improvement*.

- In western Canada samples of grain containing stones in excess of “basic grade” tolerances, up to 2.5% are graded *Wheat, Rejected “basic grade” Account Stones*. The “basic grade” refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.

- In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Wheat, Sample Canada Eastern/Can Account Stones*.
- In western and eastern Canada grain containing more than 2.5% stones is graded *Wheat, Sample Salvage*.

Examples: Western Canada

Excerpt from grade determinant tables for
Wheat, Canada Western Red Spring

*Grade name	Stones %
No. 1 CWRS	0.03
No. 2 CWRS	0.03
No. 3 CWRS	0.06
CW Feed	0.10

*Defined in the *Canada Grain Regulations*

Basic grade: *Wheat, No. 3 CWRS*

Reason for basic grade: *Mildew*

If the above sample contained	Grade in Western Canada
0.08% stones	<i>Wheat, Rejected No. 3 CWRS Account Stones</i>
1.0% stones	<i>Wheat, Rejected No. 3 CWRS Account Stones</i>
3.0% stones	<i>Wheat, Sample Salvage</i>

Examples: Eastern Canada

Excerpt from grade determinant tables for
Wheat, Canada Eastern Red Spring

*Grade name	Stones %
No. 1 CERS	0.03
No. 2 CERS	0.03
No. 3 CERS	0.06
CE Feed	0.10

*Defined in the Canada *Grain Regulations*

Basic grade: *Wheat, No. 3 CERS*

Reason for basic grade: *Mildew*

If the above sample contained	Grade in Eastern Canada
0.08% stones	<i>Wheat, CE Feed</i>
1.0% stones	<i>Wheat, Sample CE Account Stones</i>
3.0% stones	<i>Wheat, Sample Salvage</i>

Streak mould

Kernels with unusual dark grey streaks on their sides toward the brush may indicate streak mould. This very slow-growing mould is harmless in wheat, but it affects kernel appearance. It occurs most commonly in red winter wheat. It is not related to the more serious storage moulds.

Representative portion for analysis

Minimum—25 g

Optimum—50 g

Export—50 g

Procedures

For grading, include streak mould with blackpoint.

Superficial discolouration (SUPDISCLR)

Superficial discolouration is a reddish discolouration not penetrating the endosperm. This factor is evaluated subjectively in relation to the degree of soundness without reference to specific tolerances.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

**Treated seed
and other
chemical
substances**
Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals—pink or red, canola—baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Wheat, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction “*Suspected Contaminated Grain, Handling Procedures*” for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

**Wheats of
other classes
or varieties
(WOOC)**

- Other classes of wheat are all classes of wheat, including non-registered varieties, other than the predominant class in the sample.

Contrasting classes are classes of a different coloured wheat; for example, CWAD is a contrasting class in CWRs.

- Other varieties of wheat are any registered varieties.

**Representative portion for analysis
Wheats of other classes or varieties**

Factor	Minimum, grams	Optimum, grams
For wheats other than durum, soft white spring—		
Other classes that blend	25	50
Contrasting classes	50	100
For durum, soft white spring—		
Wheats of other classes	50	100
Other varieties of wheat	15	25

Working tolerance for wheats of other classes that blend

When the percentage of classes that blend is the grade determinant and is over the grade tolerance by up to 0.9%, the percentage is rounded down to and recorded as a whole number. For example, for No. 2 CWRS, 6.9%, 6.5%, or 6.3% is rounded down to 6.0%.

Note: This working tolerance only applies to registered varieties that qualify for the milling grades of wheat.

Predominant class	Wheats of other classes										
	CWRS	CWAD	CWRW	CWSWS	CWES	CPSW	CPSR	CER ¹	CEAD	CEWW	CESWS
CWRS	—	CC	B	CC	B	CC	B		CC	CC	CC
CWAD	WOOC	—	WOOC	WOOC	WOOC	WOOC	WOOC	WOOC	—	WOOC	WOOC
CWRW	B	CC	—	CC	B	CC	B		CC	CC	CC
CWSWS	WOOC	WOOC	WOOC	—	WOOC	WOOC	WOOC	WOOC	WOOC	WOOC	—
CWES	B	CC	B	CC	—	CC	B		CC	CC	CC
CPSW	CC	CC	CC		CC	—	CC	CC	CC		
CPSR	B	CC	B	CC	B	CC	—		CC	CC	CC
CER ¹		CC		CC		CC		—	CC	CC	CC
CEAD	WOOC	—	WOOC	WOOC	WOOC	WOOC	WOOC	WOOC	—	WOOC	WOOC
CEWW	CC	CC	CC		CC		CC	CC	CC	—	
CESWS	WOOC	WOOC	WOOC	—	WOOC	WOOC	WOOC	WOOC	WOOC	WOOC	—

WOOC Wheats of other classes

CC Contrasting classes

B See *Working tolerance for wheats of other classes that blend*

Note: ¹ CER is used for CERS, CEHRW and CESRW

Primary grade determinants tables

Wheat, Canada Western Red Spring (CWRS)

Grade name	Standard of quality					Foreign material					
	*Minimum test weight kg/hL (g/0.5 L)	*Variety	*Minimum hard vitreous kernels %	*Minimum protein %	*Degree of soundness	Ergot %	Excreta %	*Matter other than cereal grains %	Sclerotinia %	Stones %	*Total %
No. 1 CWRS	75.0 (365)	Any variety of red spring wheat equal to or better than Neepawa	65.0	10.0	Reasonably well matured, reasonably free from damaged kernels	0.01	0.01	0.2	0.01	0.03	0.75
No. 2 CWRS	72.0 (350)	Any variety of red spring wheat equal to or better than Neepawa	35.0	-	Fairly well matured, may be moderately bleached or frost- damaged, reasonably free from severely damaged kernels	0.02	0.01	0.3	0.02	0.03	1.5
No. 3 CWRS	69.0 (335)	Any variety of red spring wheat equal to or better than Neepawa	-	-	May be frost-damaged, immature or weather- damaged, moderately free from severely damaged kernels	0.04	0.015	0.5	0.04	0.06	3.5
CW Feed	65.0 (315)	Any class or variety of wheat excluding amber durum			Reasonably sweet, excluded from other grades of wheat on account of damaged kernels	0.10	0.03	1.0	0.10	0.10	10.0
Grade, if specs for CW Feed not met	Wheat, Sample CW Account Light Weight					Wheat, Sample CW Account Ergot	Wheat, Sample CW Account Excreta	Wheat, Sample CW Account Admixture	Wheat, Sample CW Account Admixture	2.5% or less— Wheat, Rejected grade, Account Stones Over 2.5%— Wheat, Sample Salvage	See Mixed grain

* Defined in the Canada Grain Regulations Schedule III Table I and Table V

Wheat, Canada Western Red Spring (CWRS), continued

*Grade name	Wheats of other classes or varieties		Artificial stain, no residue %	Dark, immature %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Heated	
	*Contrasting classes %	*Total %								Binburnt, severely mildewed, rotted, mouldy %	Total %
No. 1 CWRS	10	30	Nil	1.0	4.0	Nil	0.25	0.75	1.0	1 kernel per 1000 g	0.05
No. 2 CWRS	30	60	5K	2.5	7.0	Nil	1.0	2.0	3.0	4 kernels per 1000 g	0.4
No. 3 CWRS	50	100	10K	10.0	13.0	Nil	2.0	10.0	8.0	6 kernels per 1000 g	1.0
CW Feed	No limit—but not more than 10.0% amber durum	20	20	—	—	20	50	—	—	25	2.5
Grade, if specs for CW Feed not met	Over 10.0% amber durum—Wheat, Sample CW Account Admixture	Wheat, Sample CW Account Stained Kernels				Wheat, Sample CW Account Fireburnt	Wheat, Sample CW Account Fusarium Damage Over 10.0%—Wheat, Commercial Salvage			Wheat, Sample CW Account Heated	

*Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken and broken		Smudge and blackpoint		Sprouted	
				Shrunken %	Broken %	Total %	Smudge %	Total %	Severely sprouted %
No. 1 CWRS	0.5	1.5	2.0	4.0	5.0	7.0	30K	10.0	0.1
No. 2 CWRS	2.0	5.0	5.0	4.0	6.0	8.0	1.0	20.0	0.2
No. 3 CWRS	5.0	10.0	10.0	4.0	7.0	9.0	5.0	35.0	0.3
CW Feed	—	—	—	—	13.0	No limit within broken tolerances	—	—	—
Grade, if specs for CW Feed not met					Sample Broken Grain				

* Defined in the Canada Grain Regulations Schedule III Table I and V

K Number of kernel-sized pieces in 500 g

Wheat, Canada Western Amber Durum (CWAD)

	Standard of quality					Foreign material					
	*Minimum test weight kg/hL (g/0.5 L)	*Variety	*Minimum hard vitreous kernels %	*Minimum protein %	*Degree of soundness	Ergot %	Excreta %	*Matter other than cereal grains %	Sclerotinia %	Stones %	*Total %
*Grade name											
No. 1 CWAD	79.0 (387)	Any variety of amber durum wheat equal to or better than Hercules	80.0	9.5	Reasonably well matured, reasonably free from damaged kernels	0.01	0.01	0.2	0.01	0.03	0.5
No. 2 CWAD	77.0 (377)	Any variety of amber durum wheat equal to or better than Hercules	60.0	-	Reasonably well matured, reasonably free from severely damaged kernels	0.02	0.01	0.3	0.02	0.03	1.5
No. 3 CWAD	74.0 (362)	Any variety of amber durum wheat equal to or better than Hercules	40.0	-	Fairly well matured, may be moderately weather-damaged or frost-damaged, reasonably free from severely damaged kernels	0.04	0.01	0.5	0.04	0.06	2.0
No. 4 CWAD	71.0 (347)	Any variety of amber durum wheat equal to or better than Hercules	-	-	May be frost-damaged, immature or weather-damaged, moderately free from severely damaged kernels	0.04	0.01	0.5	0.04	0.06	3.0
No. 5 CWAD	-	Any variety of amber durum wheat	-	-	Reasonably sweet, excluded from higher grades on account of light weight or damaged kernels	0.10	0.03	1.0	0.10	0.10	10.0
Grade, if No. 5 specs not met						Wheat, Sample CW Account Ergot	Wheat, Sample CW Account Excreta	Wheat, Sample CW Account Admixture	Wheat, Sample CW Account	2.5% or less- Rejected (grade), Account Stones Over 2.5%- Wheat, Sample Salvage	See Mixed grain

* Defined in the Canada Grain Regulations Schedule III Table VI

Wheat, Canada Western Amber Durum (CWAD), continued

*Grade name	Wheats of other classes or varieties		Artificial stain, no residue %	Degraded %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Heated	
	*Other classes %	*Total %							Binburnt, severely mildewed, rotted, mouldy %	Total %
No. 1 CWAD	2.0	5.0	Nil	4.0	Nil	0.5	0.75	1.0	1 kernel per 1000 g	0.05
No. 2 CWAD	3.5	10.0	3K	7.0	Nil	0.5	2.0	3.0	2 kernels per 1000 g	0.10
No. 3 CWAD	5.0	15.0	7K	10.0	Nil	2.0	4.0	5.0	4 kernels per 1000 g	0.40
No. 4 CWAD	10.0	49.0	12K	13.0	Nil	2.0	10.0	8.0	0.5	1.5
No. 5 CWAD	49.0	-	2.0	-	2.0	5.0	-	-	5.0	5.0
Grade, if No. 5 specs not met	Wheat, Sample CW Account Admixture		Wheat, Sample CW Account Stained kernels		Wheat, Sample CW Account Fireburnt	Wheat, Sample CW Account Fusarium Damage Over 10.0% - Wheat, Commercial Salvage			Wheat, Sample CW Account Heated	

*Grade name	Natural stain %	Pink %	Severe midge %	Sawfly, midge %	Shrunken and broken		Smudge and blackpoint			Sprouted %
					Shrunken %	Broken %	Penetrated smudge %	Red smudge %	Total smudge %	
No. 1 CWAD	0.5	3.0	0.1	2.0	3.0	6.0	3K	30K	30K	0.5
No. 2 CWAD	2.0	6.0	0.25	8.0	3.0	8.0	0.25	1.0	1.0	2.0
No. 3 CWAD	5.0	10.0	0.75	15.0	3.0	10.0	0.50	1.0	3.0	8.0
No. 4 CWAD	7.5	-	2.0	40.0	3.0	11.0	Consider overall appearance			12.0
No. 5 CWAD	-	-	-	-	-	13.0	No limit within broken tolerances			-
Grade, if No. 5 specs not met						Sample Broken Grain				

* Defined in the Canada Grain Regulations Schedule III Table VI

K Number of kernel-sized pieces in 500 g

Wheat, Canada Western Red Winter (CWRW)

Grade name	Standard of quality					Foreign material					
	*Minimum test weight kg/hL (g/0.5 L)	*Variety	*Minimum hard vitreous kernels %	*Minimum protein %	*Degree of soundness	Ergot %	Excreta %	*Matter other than cereal grains %	Sclerotinia %	Stones %	*Total %
No. 1 CWRW	78.0 (380)	Any variety of red winter wheat equal to acceptable reference varieties	50.0	9.0	Reasonably well matured, reasonably free from damaged kernels	0.01	0.01	0.2	0.01	0.03	1.0
No. 2 CWRW	74.0 (360)	Any variety of red winter wheat equal to acceptable reference varieties	-	-	May be frost-damaged, immature or weather-damaged, moderately free from severely damaged kernels	0.04	0.015	0.5	0.04	0.06	2.0
CW Feed	65.0 (315)	Any class or variety of wheat excluding amber durum			Reasonably sweet, excluded from other grades of wheat on account of damaged kernels	0.10	0.03	1.0	0.10	0.10	10.0
Grade, if specs for CW Feed not met	Wheat, Sample CW Account Light Weight					Wheat, Sample CW Account Ergot	Sample CW Account Excreta	Wheat, Sample CW Account Admixture	Wheat, Sample CW Account Admixture	2.5% or less—Rejected (grade) Account Stones Over 2.5%—Wheat, Sample Salvage	See Mixed grain

* Defined in the Canada Grain Regulations Schedule III Table II and Table V

Wheat, Canada Western Red Winter (CWRW), continued

*Grade name	Wheats of other classes or varieties		Artificial stain, no residue %	Dark, immature %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Heated	
	*Contrasting classes %	*Total %								Binburnt, severely mildewed, rotted, mouldy %	Total %
No. 1 CWRW	1.0	3.0	Nil	1.0	4.0	Nil	2.0	0.75	1.0	1 kernel per 1000 g	0.05
No. 2 CWRW	2.5	6.0	7K	10.0	10.0	Nil	2.0	4.0	5.0	2 kernels per 1000 g	0.10
CW Feed	No limit—but not more than 10.0% amber durum		2.0	—	—	2.0	5.0	—	—	2.5	2.5
Grade, if specs for CW Feed not met	Over 10.0% amber durum—Wheat, Sample CW Account Admixture		Wheat, Sample CW Account Stained Kernels			Wheat, Sample CW Account Fireburnt	Wheat, Sample CW Account Fusarium Damage Over 10.0%—Wheat, Commercial Salvage			Wheat, Sample CW Account Heated	

*Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken and broken			Smudge and blackpoint			Sprouted %
				Shrunken %	Broken %	Total %	Penetrated smudge %	Total smudge %	Total %	
No. 1 CWRW	0.5	3.0	1.0	3.0	5.0	7.0	3K	30K	10.0	0.5
No. 2 CWRW	5.0	10.0	5.0	3.0	7.0	9.0	1.0	3.0	35.0	2.5
CW Feed	—	—	—	—	13.0	No limit within broken tolerances	—	—	—	—
Grade, if specs for CW Feed not met					Sample Broken Grain					

* Defined in the Canada Grain Regulations Schedule III Table II and Table V

K Number of kernel-sized pieces in 500 g

Wheat, Canada Western Soft White Spring (CWSWS)

*Grade name	Standard of quality			Foreign material					*Total %
	*Minimum test weight kg/hL (g/0.5 L)	*Variety	*Degree of soundness	Ergot %	Excreta %	*Matter other than cereal grains %	Sclerotinia %	Stones %	
No. 1 CWSWS	76.0 (370)	Any variety of soft white spring wheat equal to acceptable reference varieties	Reasonably well matured, reasonably free from damaged kernels	0.01	0.01	0.2	0.01	0.03	1.0
No. 2 CWSWS	74.0 (360)	Any variety of soft white spring wheat equal to acceptable reference varieties	Fairly well matured, may be moderately weather-damaged, reasonably free from severely damaged kernels	0.02	0.01	0.3	0.02	0.03	2.0
No. 3 CWSWS	69.0 (335)	Any variety of soft white spring wheat equal to acceptable reference varieties	May be frost-damaged, immature or weather-damaged, moderately free from severely damaged kernels	0.04	0.015	0.5	0.04	0.06	3.0
CW Feed	65.0 (315)	Any class or variety of wheat excluding amber durum	Reasonably sweet, excluded from other grades of wheat on account of damaged kernels	0.10	0.03	1.0	0.10	0.10	10.0
Grade, if specs for CW Feed not met	Wheat, Sample CW Account Light Weight			Wheat, Sample CW Account Ergot	Wheat, Sample CW Account Excreta	Wheat, Sample CW Account Admixture	Wheat, Sample CW Account	2.5% or less—Rejected (Grade) Account Stones Over 2.5%—Wheat, Sample Salvage	See Mixed grain

* Defined in the Canada Grain Regulations Schedule III Table IV and Table V

Wheat, Canada Western Soft White Spring (CWSWS), continued

*Grade name	Wheats of other classes or varieties %	Artificial stain, no residue %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Heated	
								Binburnt, severely mildewed, rotted, mouldy %	Total %
No. 1 CWSWS	3.0	Nil	4.0	Nil	2.0	0.75	1.0	1 kernel per 1000 g	0.05
No. 2 CWSWS	6.0	3K	7.0	Nil	2.0	2.0	3.0	2 kernels per 1000 g	0.10
No. 3 CWSWS	10.0	7K	10.0	Nil	2.0	4.0	5.0	4 kernels per 1000 g	0.40
CW Feed	No limit—but not more than 10.0% amber durum	2.0	—	2.0	5.0	—	—	2.5	2.5
Grade, if specs for CW Feed not met	Over 10.0% amber durum—Wheat, Sample CW Account Admixture	Wheat, Sample CW Account Stained Kernels		Wheat, Sample CW Account Fireburnt	10.0% or less—Wheat, Sample CW Account Fusarium Damage Over 10.0%—Wheat, Commercial Salvage			Wheat, Sample CW Account Heated	

*Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken and broken			Smudge and blackpoint		
				Shrunken %	Broken %	Total %	Penetrated smudge %	Total smudge %	Total %
No. 1 CWSWS	0.5	3.0	2.0	3.0	5.0	7.0	3K	30K	10.0
No. 2 CWSWS	2.0	6.0	8.0	3.0	6.0	8.0	0.5	1.0	15.0
No. 3 CWSWS	5.0	10.0	15.0	3.0	7.0	9.0	1.0	3.0	35.0
CW Feed	—	—	—	—	13.0	No limit within broken tolerances	—	—	—
Grade, if specs for CW Feed not met					Sample Broken Grain				

* Defined in the Canada Grain Regulations Schedule III Table IV and Table V

K Number of kernel-sized pieces in 500 g

Wheat, Canada Western Extra Strong (CWES)

*Grade name	Standard of quality				Foreign material					
	*Minimum test weight (g/0.5 L)	*Variety	*Minimum protein %	*Degree of soundness	Ergot %	Excreta %	*Matter other than cereal grains %	Sclerotinia %	Stones %	*Total %
No. 1 CWES	75.0 (365)	Any variety of extra strong red spring wheat equal to or better than Glenlea	10.0	Fairly well matured, may be moderately bleached or frost-damaged, reasonably free from severely damaged kernels	0.03	0.01	0.2	0.03	0.03	0.75
No. 2 CWES	73.0 (355)	Any variety of extra strong red spring wheat equal to or better than Glenlea	-	May be frost-damaged, immature or weather-damaged, moderately free from severely damaged kernels	0.06	0.03	0.3	0.06	0.06	1.5
CW Feed	65.0 (315)	Any class or variety of wheat excluding amber durum	-	Reasonably sweet, excluded from other grades of wheat on account of damaged kernels	0.10	0.03	1.0	0.10	0.10	10.0
Grade, if CW Feed specs not met	Wheat, Sample CW Account Light Weight				Wheat, Sample CW Account Ergot	Wheat, Sample CW Account Excreta	Wheat, Sample CW Account Admixture	Wheat, Sample CW Account Admixture	2.5% or less—Rejected (grade), Account Stones, Over 2.5%—Wheat, Sample Salvage	See Mixed grain

* Defined in the Canada Grain Regulations Schedule III Table III and Table V

Wheat, Canada Western Extra Strong (CWES), continued

*Grade name	Wheats of other classes or varieties		Artificial stain, no residue %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Heated	
	*Contrasting classes %	*Total %							Binburnt, severely mildewed, rotted, mouldy %	Total %
No. 1 CWES	1.5	3.0	5K	7.0	Nil	1.0	2.0	3.0	4 kernels per 1000 g	0.4
No. 2 CWES	2.5	5.0	10K	13.0	Nil	1.0	10.0	8.0	6 kernels per 1000 g	1.0
CW Feed	No limit—but not more than 10.0% amber durum		2.0	—	2.0	5.0	—	—	2.5	2.5
Grade, if CW Feed specs not met	Over 10.0% amber durum—Wheat, Sample CW Account Admixture		Wheat, Sample CW Account Stained Kernels		Wheat, Sample CW Account Fireburnt	10.0% or less—Wheat, Sample CW Account Fusarium Damage Over 10.0%—Wheat Commercial Salvage			Wheat, Sample CW Account Heated	

*Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken and broken		Smudge and blackpoint		Sprouted %
				Shrunken %	Broken %	Smudge %	Total %	
No. 1 CWES	2.0	5.0	2.0	3.0	7.0	1.0	15.0	0.5
No. 2 CWES	5.0	10.0	5.0	3.0	7.0	Consider overall appearance		2.0
CW Feed	—	—	—	—	13.0	—		—
Grade, if CW Feed specs not met					Sample Broken Grain			

* Defined in the Canada Grain Regulations Schedule III Table III and Table V

K Number of kernel-sized pieces in 500 g

Wheat, Canada Prairie Spring White (CPSW)

*Grade name	Standard of quality			Foreign material					*Total %
	*Minimum test weight kg/hL (g/0.5 L)	*Variety	*Degree of soundness	Ergot %	Excreta %	*Matter other than cereal grains %	Sclerotinia %	Stones %	
No. 1 CPSW	77.0 (375)	Any variety of CPSW wheat equal to acceptable reference varieties	Fairly well matured, may be moderately bleached or frost-damaged, reasonably free from severely damaged kernels	0.03	0.01	0.2	0.03	0.03	0.75
No. 2 CPSW	75.0 (365)	Any variety of CPSW wheat equal to acceptable reference varieties	May be frost-damaged, immature or weather-damaged, moderately free from severely damaged kernels	0.06	0.03	0.3	0.06	0.03	1.5
CWICE Feed	65.0 (315)	Any class or variety of wheat excluding amber durum	Reasonably sweet, excluded from other grades of wheat on account of damaged kernels	0.10	0.03	1.0	0.10	0.10	10.0
Grade, if specs for CWICE Feed not met	Wheat, Sample Canada Account Light Weight			Wheat, Sample Canada Account Ergot	Wheat, Sample Canada Account Excreta	Wheat, Sample Canada Account Admixture	Wheat, Sample Canada Account Admixture	2.5% or less—Rejected (grade) Account Stones or Wheat, Sample Canada Account Stones Over 2.5%—Wheat, Sample Salvage	See Mixed grain

* Defined in the Canada Grain Regulations Schedule III Table XV.1, Table V and Table XXXV

Canada Prairie Spring White (CPSW) continued

*Grade name	Wheats of other classes or varieties		Artificial stain, no residue %	Dark immature %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper %	Heated	
	*Contrasting classes %	*Total %								Binburnt, severely mildewed, rotted, mouldy %	Total %
No. 1 CPSW	3.0	5.0	5K	2.5	7.0	Nil	2.0	2.0	3.0	4 kernels per 1000 g	0.4
No. 2 CPSW	5.0	10.0	10K	10.0	13.0	Nil	2.0	10.0	8.0	6 kernels per 1000 g	1.0
CWICE Feed	No limit—but not more than 10.0% amber durum		2.0	—	—	2.0	5.0	—	—	2.5	2.5
Grade, if specs for CWICE Feed not met	Over 10.0% amber durum—Wheat, Sample Canada Account Admixture		Wheat, Sample Canada Account Stained kernels			Wheat, Sample Canada Account Fireburnt	10.0% or less—Wheat, Sample Canada Account Damage Over 10.0%—Wheat, Commercial Salvage			Wheat, Sample Canada Account Heated	

*Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken and broken			Smudge and blackpoint			Sprouted %
				Shrunken %	Broken %	Total %	Penetrated smudge %	Total smudge %	Total %	
No. 1 CPSW	2.0	5.0	3.0	5.0	6.0	9.0	10K	1.0	20.0	0.5
No. 2 CPSW	5.0	10.0	8.0	5.0	6.0	9.0	0.5	5.0	35.0	2.0
CWICE Feed	—	—	—	—	13.0	No limit within broken tolerances	—	—	—	—
Grade, if specs for CWICE Feed not met					Sample Broken Grain					

* Defined in the Canada Grain Regulations Schedule III Table XV.1, Table V and Table XXXV

K Number of kernel-sized pieces in 500 g

Wheat, Canada Prairie Spring Red (CPSR)

Grade name	Standard of quality			Foreign material					
	*Minimum test weight kg/hL (g/0.5 L)	*Variety	*Degree of soundness	Ergot %	Excreta %	*Matter other than cereal grains %	Sclerotinia %	Stones %	*Total %
No. 1 CPSR	77.0 (375)	Any variety of CPSR wheat equal to acceptable reference varieties	Fairly well matured, may be moderately bleached or frost-damaged, reasonably free from severely damaged kernels	0.03	0.01	0.2	0.03	0.03	0.75
No. 2 CPSR	75.0 (365)	Any variety of CPSR wheat equal to acceptable reference varieties	May be frost-damaged, immature or weather-damaged, moderately free from severely damaged kernels	0.06	0.03	0.3	0.06	0.03	1.5
CWICE Feed	65.0 (315)	Any class or variety of wheat excluding amber durum	Reasonably sweet, excluded from other grades of wheat on account of damaged kernels	0.10	0.03	1.0	0.10	0.10	10.0
Grade, if specs for CWICE Feed not met	Wheat, Sample Canada, Account Light Weight			Wheat, Sample Canada Account Ergot	Wheat, Sample Canada Account Excreta	Wheat Sample Canada Account Admixture	Wheat, Sample Canada Account Admixture	25% or less—Rejected (grade) Account Stones or Wheat, Sample Canada Account Stones Over 2.5%—Wheat, Sample Salvage	See Mixed Grain

* Defined in the Canada Grain Regulations Schedule III Table XV, Table V and Table XXXV

Wheat, Canada Prairie Spring Red (CPSR), continued

*Grade name	Wheats of other classes or varieties		Artificial stain no residue %	Dark immature %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper %	Heated	
	*Contrasting classes %	*Total %								Binburnt, severely mildewed, rotted, mouldy %	Total %
No. 1 CPSR	3.0	5.0	5K	2.5	7.0	Nil	2.0	2.0	3.0	4 kernels per 1000 g	0.4
No. 2 CPSR	5.0	10.0	10K	10.0	13.0	Nil	2.0	10.0	8.0	6 kernels per 1000 g	1.0
CWICE Feed	No limit-but not more than 10.0% amber durum	2.0		—	—	2.0	5.0	—	—	2.5	2.5
Grade, if specs for CWICE Feed not met	Over 10.0% amber durum— Wheat, Sample Canada Account Admixture		Wheat, Sample Canada Account Stained kernels			Wheat, Sample Canada Account Fireburnt	10.0% or less— Wheat, Sample Canada Account Fusarium Damage Over 10.0%— Wheat, Commercial Salvage			Wheat, Sample Canada Account Heated	

*Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken and broken			Smudge and blackpoint			Sprouted %
				Shrunken %	Broken %	Total %	Penetrated smudge %	Total smudge %	Total %	
No. 1 CPSR	2.0	5.0	3.0	5.0	6.0	9.0	10K	1.0	20.0	0.5
No. 2 CPSR	5.0	10.0	8.0	5.0	6.0	9.0	0.5	5.0	35.0	2.0
CWICE Feed	—	—	—	—	13.0	No limit within broken tolerances	—	—	—	—
Grade, if specs for CWICE Feed not met					Sample Broken Grain					

* Defined in the Canada Grain Regulations Schedule III Table XV, Table V and Table XXXV

K Number of kernel-sized pieces in 500 g

Wheat, Canada Eastern Red (CER)

*Grade name	Standard of quality			Foreign material					
	*Minimum test weight kg/hL (g/0.5 L)	*Variety	*Degree of soundness	Ergot %	Excreta %	*Matter other than cereal grains %	Sclerotinia %	Stones %	*Total %
No. 1 CER	75.0 (365)	Any variety of red wheat	Reasonably well matured, reasonably free from damaged kernels	0.01	0.01	0.2	0.01	0.03	0.75
No. 2 CER	72.0 (350)	Any variety of red wheat	Fairly well matured, reasonably free from severely damaged kernels	0.02	0.015	0.3	0.02	0.03	1.5
No. 3 CER	69.0 (335)	Any variety of red wheat	May be frost-damaged, immature or weather-damaged, moderately free from severely damaged kernels	0.04	0.015	0.5	0.04	0.06	3.5
CE Feed	65.0 (315)	Any class or variety of wheat excluding amber durum	Reasonably sweet, excluded from other grades of wheat on account of damaged kernels	0.10	0.03	1.0	0.25	0.10	10.0
Grade, if specs for CE Feed not met	Wheat, Sample CE Account Light Weight			Wheat, Sample CE Account Ergot	Sample CE Account Excreta	Wheat, Sample CE Account Admixture	Wheat, Sample CE Account Admixture	2.5% or less— Wheat, Sample CE Account Stones Over 2.5%— Wheat, Sample Salvage	See Mixed grain

* Defined in the Canada Grain Regulations Schedule III Table XXX and Table XXXV

Wheat, Canada Eastern Red (CER), continued

*Grade name	*Contrasting classes %	Artificial stain, no residue %	Dark immature %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Heated	
									Binburnt, severely mildewed, rotted, mouldy %	Total %
No. 1 CER	1.0	Nil	1.0	4.0	Nil	1.0	0.75	1.0	2K	0.1
No. 2 CER	3.0	3K	2.5	7.0	Nil	1.0	2.0	3.0	5K	0.75
No. 3 CER	5.0	7K	10.0	10.0	Nil	1.0	4.0	5.0	10K	2.0
CE Feed	No limit—but not more than 10.0% amber durum	2.0	—	—	2.0	5.0	—	—	10.0	10.0
Grade, if specs for CE Feed not met	50.0% or less amber durum—Wheat, Sample CE Account Admixture	Wheat, Sample CE Account Stained kernels			Wheat, Sample CE Account Fireburnt	Wheat, Sample CE Account Fusarium Damage			Wheat, Sample CE Account Heated	Wheat, Sample CE Account Heated

*Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken and broken			Smudge and blackpoint			
				Shrunken %	Broken %	Total %	Penetrated smudge %	Total smudge %	Total %	Sprouted %
No. 1 CER	0.5	1.5	2.0	6.0	6.0	7.0	3K	30K	10.0	0.5
No. 2 CER	2.0	5.0	8.0	10.0	10.0	11.0	0.5	1.0	20.0	2.5
No. 3 CER	5.0	10.0	15.0	12.0	10.0	13.0	1.0	5.0	35.0	8.0
CE Feed	—	—	—	—	50.0	No limit within broken tolerances	—	—	—	—
Grade, if specs for CE Feed not met					Sample Broken Grain					

* Defined in the Canada Grain Regulations Schedule III Table XXX and Table XXXV

K Number of kernel-sized pieces in 500 g

Wheat, Canada Eastern Red Spring (CERS)

*Grade name	Standard of quality			Foreign material					
	*Minimum test weight kg/hL (g/0.5 L)	*Variety	*Degree of soundness	Ergot %	Excreta %	*Matter other than cereal grains %	Sclerotinia %	Stones %	*Total %
No. 1 CERS	75.0 (365)	Any variety of red spring wheat	Reasonably well matured, reasonably free from damaged kernels	0.01	0.01	0.2	0.01	0.03	0.75
No. 2 CERS	72.0 (350)	Any variety of red spring wheat	Fairly well matured, may be moderately weather-damaged, reasonably free from severely damaged kernels	0.02	0.015	0.3	0.02	0.03	1.5
No. 3 CERS	69.0 (335)	Any variety of red spring wheat	May be immature or weather-damaged, moderately free from severely damaged kernels	0.04	0.015	0.5	0.04	0.06	3.5
CE Feed	65.0 (315)	Any class or variety of wheat excluding amber durum	Reasonably sweet, excluded from other grades of wheat on account of damaged kernels	0.10	0.03	1.0	0.25	0.10	10.0
Grade, if specs for CE Feed not met	Wheat, Sample CE Account Light Weight			Wheat, Sample CE Account Ergot	Wheat, Sample CE Account Excreta	Wheat, Sample CE Account Admixture	Wheat, Sample CE Account Admixture	2.5% or less— Wheat, Sample CE Account Stones Over 2.5%— Wheat, Sample Salvage	See Mixed grain

* Defined in the Canada Grain Regulations Schedule III Table XXX, 1 and Table XXXV

Wheat, Canada Eastern Red Spring (CERS), continued

*Grade name	*Contrasting classes %	Artificial stain, no residue %	Dark immature %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Heated	
									Binburnt, severely mildewed, rotted, mouldy %	Total %
No. 1 CERS	1.0	Nil	1.0	4.0	Nil	1.0	0.75	1.0	2K	0.1
No. 2 CERS	3.0	3K	2.5	7.0	Nil	1.0	2.0	3.0	5K	0.75
No. 3 CERS	5.0	7K	10.0	10.0	Nil	1.0	4.0	5.0	10K	2.0
CE Feed	No limit-but not more than 10.0% amber durum	2.0	-	-	2.0	5.0	-	-	10.0	10.0
Grade, if specs for CE Feed not met	50.0% or less amber durum- Wheat, Sample CE Account Admixture	Wheat, Sample CE Account Stained kernels			Wheat, Sample CE Account Fireburnt	Wheat, Sample CE Account Fusarium Damage			Wheat, Sample CE Account Heated	Wheat, Sample CE Account Heated

*Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken and broken			Smudge and blackpoint			Sprouted %
				Shrunken %	Broken %	Total %	Penetrated smudge %	Total smudge %	Total %	
No. 1 CERS	0.5	1.5	2.0	6.0	6.0	7.0	3K	30K	10.0	0.5
No. 2 CERS	2.0	5.0	8.0	10.0	10.0	11.0	0.5	1.0	20.0	2.5
No. 3 CERS	5.0	10.0	15.0	12.0	10.0	13.0	1.0	5.0	35.0	8.0
CE Feed	-	-	-	-	50.0	No limit within broken tolerances	-	-	-	-
Grade, if specs for CE Feed not met					Sample Broken Grain					

* Defined in the Canada Grain Regulations Schedule III Table XXX.1 and Table XXXV
 K Number of kernel-sized pieces in 500 g

Wheat, Canada Eastern Hard Red Winter (CEHRW)

*Grade name	Standard of quality			Foreign material					
	*Minimum test weight kg/hL (g/0.5 L)	*Variety	*Degree of soundness	Ergot %	Excreta %	*Matter other than cereal grains %	Sclerotinia %	Stones %	*Total %
No. 1 CEHRW	76.0 (370)	Any variety of hard red winter wheat	Reasonably well matured, reasonably free from damaged kernels	0.01	0.01	0.2	0.01	0.03	0.75
No. 2 CEHRW	74.0 (360)	Any variety of hard red winter wheat	Fairly well matured, may be moderately weather-damaged, reasonably free from severely damaged kernels	0.02	0.015	0.3	0.02	0.03	1.5
No. 3 CEHRW	69.0 (335)	Any variety of hard red winter wheat	May be immature or weather-damaged, moderately free from severely damaged kernels	0.04	0.015	0.5	0.04	0.06	3.5
CE Feed	65.0 (315)	Any class or variety of wheat excluding amber durum	Reasonably sweet, excluded from other grades of wheat on account of damaged kernels	0.10	0.03	1.0	0.25	0.10	10.0
Grade, if specs for CE Feed not met	Wheat, Sample CE Account Light Weight			Wheat, Sample CE Account Ergot	Wheat, Sample CE Account Excreta	Wheat, Sample CE Account Admixture	Wheat, Sample CE Account Admixture	2.5% or less—Wheat, Sample CE Account Stones Over 2.5%—Wheat, Sample Salvage	See Mixed grain

* Defined in the Canada Grain Regulations Schedule III Table XXX.2 and Table XXXV

Wheat, Canada Eastern Hard Red Winter (CEHRW), continued

*Grade name	*Contrasting classes %	Artificial stain, no residue %	Dark immature %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Heated	
									Binburnt, severely midewed, rotted, mouldy %	Total %
No. 1 CEHRW	1.0	Nil	1.0	4.0	Nil	1.0	0.75	1.0	2K	0.1
No. 2 CEHRW	3.0	3K	2.5	7.0	Nil	1.0	2.0	3.0	5K	0.75
No. 3 CEHRW	5.0	7K	10.0	10.0	Nil	1.0	4.0	5.0	10K	2.0
CE Feed	No limit—but not more than 10.0% amber durum	2.0	—	—	2.0	5.0	—	—	10.0	10.0
Grade, if specs for CE Feed not met	50.0% or less amber durum—Wheat, Sample CE Account Admixture	Wheat, Sample CE Account Stained Kernels			Wheat, Sample CE Account Fireburnt	Wheat, Sample CE Account Fusarium Damage			Wheat, Sample CE Account Heated	Wheat, Sample CE Account Heated

*Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken and broken		Smudge and blackpoint			Sprouted %
				Shrunken %	Broken %	Total %	Penetrated smudge %	Total smudge %	Total %
No. 1 CEHRW	0.5	1.5	2.0	6.0	6.0	7.0	3K	30K	10.0
No. 2 CEHRW	2.0	5.0	8.0	10.0	10.0	11.0	0.5	1.0	20.0
No. 3 CEHRW	5.0	10.0	15.0	12.0	10.0	13.0	1.0	5.0	35.0
CE Feed	—	—	—	—	50.0	No limit within broken tolerances	—	—	—
Grade, if specs for CE Feed not met					Sample Broken Grain				

* Defined in the Canada Grain Regulations Schedule III Table XXX.2 and Table XXXV

K Number of kernel-sized pieces in 500 g

Wheat, Canada Eastern Soft Red Winter (CESRW)

*Grade name	Standard of quality			Foreign material					
	*Minimum test weight kg/hL (g/0.5 L)	*Variety	*Degree of soundness	Ergot %	Excreta %	*Matter other than cereal grains %	Sclerotinia %	Stones %	*Total %
No. 1 CESRW	76.0 (370)	Any variety of soft red winter wheat	Reasonably well matured, reasonably free from damaged kernels	0.01	0.01	0.2	0.01	0.03	0.75
No. 2 CESRW	74.0 (360)	Any variety of soft red winter wheat	Fairly well matured, may be moderately weather-damaged, reasonably free from severely damaged kernels	0.02	0.015	0.3	0.02	0.03	1.5
No. 3 CESRW	69.0 (335)	Any variety of soft red winter wheat	May be immature or weather-damaged, moderately free from severely damaged kernels	0.04	0.015	0.5	0.04	0.06	3.5
CE Feed	65.0 (315)	Any class or variety of wheat excluding amber durum	Reasonably sweet, excluded from other grades of wheat on account of damaged kernels	0.10	0.03	1.0	0.25	0.10	10.0
Grade, if specs for CE Feed not met	Wheat, Sample CE Account Light Weight			Wheat, Sample CE Account Ergot	Wheat, Sample CE Account Excreta	Wheat, Sample CE Account Admixture	Wheat, Sample CE Account Admixture	2.5% or less—Wheat, Sample CE Account Stones Over 2.5%—Wheat, Sample Salvage	See Mixed grain

* Defined in the Canada Grain Regulations Schedule III Table XXX.3 and Table XXXV

Wheat, Canada Eastern Soft Red Winter (CESRW), continued

*Grade name	*Contrasting classes %	Artificial stain, no residue %	Dark immature %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Heated	
									Binburnt, severely mildewed, rotted, mouldy %	Total %
No. 1 CESRW	1.0	Nil	1.0	4.0	Nil	1.0	0.75	1.0	2K	0.1
No. 2 CESRW	3.0	3K	2.5	7.0	Nil	1.0	2.0	3.0	5K	0.75
No. 3 CESRW	5.0	7K	10.0	10.0	Nil	1.0	4.0	5.0	10K	2.0
CE Feed	No limit—but not more than 10.0% amber durum	2.0	—	—	2.0	5.0	—	—	10.0	10.0
Grade, if specs for CE Feed not met	50.0% or less amber durum—Wheat, Sample CE Account Admixture	Wheat, Sample CE Account Stained Kernels			Wheat, Sample CE Account Fireburnt	Wheat, Sample CE Account Fusarium Damage			Wheat, Sample CE Account Heated	Wheat, Sample CE Account Heated

*Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken and broken			Smudge and blackpoint			Sprouted %
				Shrunken %	Broken %	Total %	Penetrated smudge %	Total smudge %	Total %	
No. 1 CESRW	0.5	1.5	2.0	6.0	6.0	7.0	3K	30K	10.0	0.5
No. 2 CESRW	2.0	5.0	6.0	10.0	10.0	11.0	0.5	1.0	20.0	2.5
No. 3 CESRW	5.0	10.0	15.0	12.0	10.0	13.0	1.0	5.0	35.0	8.0
CE Feed	—	—	—	—	50.0	No limit within broken tolerances	—	—	—	—
Grade, if specs for CE Feed not met					Sample Broken Grain					

* Defined in the Canada Grain Regulations Schedule III Table XXX.3 and Table XXXV

K Number of kernel-sized pieces in 500 g

Wheat, Canada Eastern Amber Durum (CEAD)

Grade name	Standard of quality				Foreign material					
	*Minimum test weight kg/hL (g/0.5 L)	*Variety	*Minimum hard vitreous kernels %	*Degree of soundness	Ergot %	Excreta %	*Matter other than cereal grains %	Sclerotinia %	Stones %	*Total %
No. 1 CEAD	79.0 (387)	Any variety of amber durum wheat equal to Hercules	60.0	Reasonably well matured, reasonably free from damaged kernels	0.01	0.01	0.2	0.01	0.03	0.5
No. 2 CEAD	77.0 (377)	Any variety of amber durum wheat equal to Hercules	60.0	Reasonably well matured, reasonably free from severely damaged kernels	0.02	0.01	0.3	0.02	0.03	1.5
No. 3 CEAD	74.0 (362)	Any variety of amber durum wheat equal to Hercules	40.0	Fairly well matured, may be moderately weather-damaged or frost-damaged, reasonably free from severely damaged kernels	0.04	0.01	0.5	0.04	0.03	2.0
CE Feed Durum	—	Any variety of amber durum wheat	—	Reasonably sweet, excluded from higher grades on account of light weight or damaged kernels	0.10	0.03	1.0	0.25	0.10	10.0
Grade, if specs for Feed Durum not met					Wheat, Sample CE Account Ergot	Wheat, Sample CE Account Excreta	Wheat, Sample CE Account Admixture	Wheat, Sample CE Account Admixture	2.5% or less— Wheat, Sample Stones Over 2.5%— Wheat, Sample Salvage	See Mixed grain

* Defined in the Canada Grain Regulations Schedule III Table XLV

Wheat, Canada Eastern Amber Durum (CEAD), continued

*Grade name	Wheats of other classes or varieties		Artificial stain, no residue %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Heated	
	*Other classes %	*Total %							Binburnt, severely mildewed, rotted, mouldy %	Total %
No. 1 CEAD	2.0	5.0	Nil	4.0	Nil	1.0	0.75	1.0	2K	0.10
No. 2 CEAD	3.5	10.0	3K	7.0	Nil	1.0	2.0	3.0	4K	0.25
No. 3 CEAD	5.0	15.0	7K	10.0	Nil	1.0	4.0	5.0	6K	0.75
CE Feed Durum	49.0	-	2.0	-	2.0	5.0	-	-	10.0	10.0
Grade, if specs for Feed Durum not met	Wheat, Sample CE Account Admixture		Wheat, Sample CE Account Stained Kernels		Wheat, Sample CE Account Fireburnt	Wheat, Sample CE Account Fusarium Damage			Wheat, Sample CE Account Heated	Wheat, Sample CE Account Heated

*Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken and broken		Smudge and blackpoint			
				Shrunken %	Broken %	Total %	Penetrated smudge %	Red smudge %	Total %
No. 1 CEAD	0.5	3.0	2.0	6.0	6.0	7.0	3K	30K	10.0
No. 2 CEAD	2.0	6.0	8.0	10.0	10.0	10.0	0.5	1.0	15.0
No. 3 CEAD	5.0	10.0	15.0	12.0	10.0	15.0	1.0	1.5	35.0
CE Feed Durum	-	-	-	-	50.0	No limit within broken tolerances	-	-	-
Grade, if specs for Feed Durum not met					Sample Broken Grain				

* Defined in the Canada Grain Regulations Schedule III Table XIV

K. Number of kernel-sized pieces in 500 g

Wheat, Canada Eastern White Winter (CEWW)

*Grade name	Standard of quality			Foreign material					
	*Minimum test weight kg/hL (g/0.5 L)	*Variety	*Degree of soundness	Ergot %	Excreta %	*Matter other than cereal grains %	Sclerotinia %	Stones %	*Total %
No. 1 CEWW	76.0 (370)	Any variety of white winter wheat equal to acceptable reference varieties	Reasonably well matured, reasonably free from damaged kernels	0.01	0.01	0.2	0.01	0.03	1.0
No. 2 CEWW	74.0 (360)	Any variety of white winter wheat equal to acceptable reference varieties	Fairly well matured, may be moderately weather-damaged, reasonably free from severely damaged kernels	0.02	0.015	0.3	0.02	0.03	2.0
No. 3 CEWW	69.0 (335)	Any variety of white winter wheat equal to acceptable reference varieties	May be immature or weather-damaged, moderately free from severely damaged kernels	0.04	0.015	0.5	0.04	0.03	3.0
CE Feed	65.0 (315)	Any class or variety of wheat excluding amber durum	Reasonably sweet, excluded from other grades of wheat on account of damaged kernels	0.10	0.03	1.0	0.25	0.10	10.0
Grade, if specs for CE Feed not met	Wheat, Sample CE Account Light Weight			Wheat, Sample CE Account Ergot	Wheat, Sample CE Account Excreta	Wheat, Sample CE Account Admixture	Wheat, Sample CE Account Admixture	2.5% or less—Wheat, Sample CE Account Stones Over 2.5%—Wheat, Sample Salvage	See Mixed grain

* Defined in the Canada Grain Regulations Schedule III Table XXXI and Table XXXV

Wheat, Canada Eastern White Winter (CEWW), continued

*Grade name	Wheats of other classes or varieties		Artificial stain, no residue %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Heated	
	*Contrasting classes %	*Total %							Binburnt, severely mildewed, rotted, mouldy %	Total %
No. 1 CEWW	1.0	5.0	Nil	4.0	Nil	1.0	0.75	1.0	2K	0.10
No. 2 CEWW	2.0	6.0	3K	7.0	Nil	1.0	2.0	3.0	4K	0.25
No. 3 CEWW	3.0	10.0	7K	10.0	Nil	1.0	4.0	5.0	6K	0.75
CE Feed	No limit—but not more than 10.0% amber durum		2.0	—	2.0	5.0	—	—	5.0	5.0
Grade, if specs for CE Feed not met	50.0% or less amber durum—Wheat, Sample CE Account Admixture		Wheat, Sample CE Account Stained Kernels		Wheat, Sample CE Account Fireburnt	Wheat, Sample CE Account Fusarium Damage			Wheat, Sample CE Account Heated	Wheat, Sample CE Account Heated

*Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken and broken %	Smudge and blackpoint			Sprouted %
					Penetrated smudge %	Total smudge %	Total %	
No. 1 CEWW	0.5	3.0	2.0	3.0	3K	30K	10.0	1.0
No. 2 CEWW	2.0	6.0	8.0	5.0	0.5	1.0	15.0	5.0
No. 3 CEWW	5.0	10.0	15.0	8.0	1.0	3.0	35.0	8.0
CE Feed	—	—	—	No limit—maximum 50.0% broken	—	—	—	—
Grade, if specs for CE Feed not met				Over 50.0% broken—Sample Broken Grain				

* Defined in the Canada Grain Regulations Schedule III Table XXXI and Table XXXV

K Number of kernel-sized pieces in 500 g

Wheat, Canada Eastern Soft White Spring (CESWS)

*Grade name	Standard of quality			Foreign material					
	*Minimum test weight kg/hL (g/0.5 L)	*Variety	*Degree of soundness	Ergot %	Excreta %	*Matter other than cereal grains %	Sclerotinia %	Stones %	*Total %
No. 1 CESWS	78.0 (380)	Any variety of soft white spring wheat equal to acceptable reference varieties	Reasonably well matured, reasonably free from damaged kernels	0.01	0.01	0.2	0.01	0.03	1.0
No. 2 CESWS	74.0 (360)	Any variety of soft white spring wheat equal to acceptable reference varieties	Fairly well matured, may be moderately weather-damaged, reasonably free from severely damaged kernels	0.02	0.01	0.3	0.02	0.03	2.0
No. 3 CESWS	69.0 (335)	Any variety of soft white spring wheat equal to acceptable reference varieties	May be frost-damaged, immature or weather-damaged, moderately free from severely damaged kernels	0.04	0.015	0.5	0.04	0.03	3.0
CE Feed	65.0 (315)	Any class or variety of wheat excluding amber durum	Reasonably sweet, excluded from other grades of wheat on account of damaged kernels	0.10	0.03	1.0	0.25	0.10	10.0
Grade, if specs for CE Feed not met	Wheat, Sample CE Account Light Weight			Wheat, Sample CE Account Ergot	Wheat, Sample CE Account Excreta	Wheat, Sample CE Account Admixture	Wheat, Sample CE Account Admixture	2.5% or less—Wheat, Sample CE Account Stones Over 2.5%—Wheat, Sample Salvage	See Mixed grain

* Defined in the Canada Grain Regulations Schedule III Table XXXIV and Table XXXV

Wheat, Canada Eastern Soft White Spring (CESWS), continued

*Grade name	*Wheats of other classes or varieties %	Artificial stain, no residue %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Heated	
								Binburnt, severely mildewed, mouldy %	Total %
No. 1 CESWS	3.0	Nil	4.0	Nil	1.0	0.75	1.0	2K	0.1
No. 2 CESWS	6.0	3K	7.0	Nil	1.0	2.0	3.0	4K	0.25
No. 3 CESWS	10.0	7K	10.0	Nil	1.0	4.0	5.0	6K	0.75
CE Feed	No limit—but not more than 10.0% amber durum	2.0	—	2.0	5.0	—	—	5.0	5.0
Grade, if specs for CE Feed not met	50.0% or less—Wheat, Sample CE Account Admixture	Wheat, Sample CE Account Stained Kernels		Wheat, Sample CE Account Fireburnt	Wheat, Sample CE Account Fusarium Damage			Wheat, Sample CE Account Heated	Wheat, Sample CE Account Heated

*Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken and broken			Smudge and blackpoint		
				Shrunken %	Broken %	Total %	Penetrated smudge %	Total smudge %	Sprouted %
No. 1 CESWS	0.5	3.0	2.0	6.0	6.0	7.0	3K	30K	1.0
No. 2 CESWS	2.0	6.0	8.0	10.0	10.0	11.0	0.5	1.0	5.0
No. 3 CESWS	5.0	10.0	15.0	—	13.0	No limit within broken tolerances	1.0	3.0	8.0
CE Feed	—	—	—		50.0		—	—	—
Grade, if specs for CE Feed not met					Sample Broken Grain				

* Defined in the Canada Grain Regulations Schedule III Table XXXIV and Table XXXV

K Number of kernel-sized pieces in 500 g

Export shipments

Export shipments can be commercially clean or not commercially clean.

Commercially clean

Shipments are defined as commercially clean when meeting the commercially clean specifications listed in the export grade determinant table upon following the *Determination of commercially clean* procedures described in this chapter.

Dockage is not reported for commercially clean shipments.

Not commercially clean (NCC)

If any of the components exceed the allowable limits as defined in the tables, the shipment becomes *not commercially clean*, and dockage is assessed using procedures for primary samples.

Shipments which do not meet the standards for commercial cleanliness are referred to as not commercially clean. Such shipments are permitted only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal and transfer elevators, dockage is reported to the nearest 0.1%, less a deduction of up to 0.2% to take into account the buildup of attritional material. See *Glossary*.

Grading

Wheat on export is graded using standard samples and export specifications. Where there are no export specifications, the primary specifications are used.

Export grade determinant tables

Wheat, Canada Western Red Spring (CWRS)

Column	1	2	3	4	*5 (2+3+4)	6	7	*8 (2+6+7)	9	10	11	12	13	*14 (2+3+4+6+7 +10+11+12+13)
Grade name	Broken grain through #5 buckwheat sieve %	Small seeds %	Attrition %	Roughage %	Total small seeds, attrition and roughage %	Large seeds %	Wild oats %	Total small seeds, large seeds and wild oats %	Stones %	Mineral matter including stones %	Ergot %	Sclerotinia %	Other cereal grains and other matter %	Total foreign material %
No. 1 CWRS	0.30	0.05	0.10	0.05	0.10	0.20	0.05	0.20	0.03	0.06	0.01	0.01	0.40	0.40
No. 2 CWRS	0.30	0.05	0.10	0.05	0.10	0.20	0.05	0.20	0.03	0.10	0.02	0.02	0.75	0.75
No. 3 CWRS	0.30	0.05	0.10	0.05	0.10	0.20	0.05	0.20	0.06	0.10	0.04	0.04	1.25	1.25
CW Feed	0.50	0.05	0.10	0.10	0.10	0.50	0.10	0.50	0.10	0.25	0.10	0.10	5.0	5.0

Grade name	Wheats of other classes or varieties		Minimum hard vitreous kernels %	Sprouted		Heated	Shrunken and broken		
	Contrasting classes %	Total %		Severely sprouted %	Total %		Binburnt, severely mildewed, rotted, mouldy %	Shrunken %	Broken %
No. 1 CWRS	0.50	1.5	65.0	0.1	0.5		1 kernel per 1000 g	4.0	5.0
No. 2 CWRS	1.5	3.0	35.0	0.2	1.0		4 kernels per 1000 g	4.0	6.0
No. 3 CWRS	2.5	5.0	No minimum	0.3	3.0		6 kernels per 1000 g	4.0	7.0
CW Feed	No limit—but not more than 10.0% amber durum			No limit	No limit	2.5		4.0	13.0
									15.0

* Columns which represent a subtotal of other columns show the columns to be added in parenthesis. The area inside dashed lines refers to factors which are assessed in determining commercial cleanliness. Total foreign material does not include broken wheat passing through the #5 buckwheat sieve.

Wheat, Canada Western Amber Durum (CWAD)

Column	1	Foreign material												
		2	3	4	*5 (2 + 3 + 4)	6	7	*8 (2 + 6 + 7)	9	10	11	12	13	*14 (2 + 3 + 4 + 6 + 7 + 10 + 11 + 12 + 13)
Grade name	Broken grain through #5 buckwheat sieve %	Small seeds %	Attrition %	Roughage %	Total small seeds, attrition and roughage %	Large seeds %	Wild oats %	Total small seeds, large seeds and wild oats %	Stones %	Mineral matter including stones %	Ergot %	Sclerotinia %	Other cereal grains and other matter %	Total foreign material %
No. 1 CWAD	0.30	0.05	0.10	0.05	0.10	0.20	0.10	0.20	0.03	0.06	0.01	0.01	0.5	0.5
No. 2 CWAD	0.30	0.05	0.10	0.05	0.10	0.20	0.15	0.20	0.03	0.10	0.02	0.02	0.8	0.8
No. 3 CWAD	0.30	0.05	0.10	0.05	0.10	0.20	0.15	0.20	0.06	0.10	0.04	0.04	1.0	1.0
No. 4 CWAD	0.50	0.05	0.10	0.05	0.10	0.20	0.15	0.20	0.06	0.10	0.04	0.04	3.0	3.0
No. 5 CWAD	0.50	0.05	0.10	0.10	0.10	0.50	0.15	1.0	0.10	0.25	0.10	0.10	5.0	5.0

Grade name	Wheats of other classes or varieties		Minimum hard vitreous kernels %	Sprouted %	Heated		Shrunken and broken			Smudge and blackpoint					
										Smudge					
	Binburnt, severely mildewed, rotted, mouldy %	Total %			Shrunken %	Broken %	Total %	Penetrated %	Red %						Total %
No. 1 CWAD	2.0	3.0	80.0	0.5	1 kernel per 1000 g	0.05	3.0	6.0	7.0	3K	30K	30K	5.0		
No. 2 CWAD	2.5	5.0	60.0	2.0	2 kernels per 1000 g	0.1	3.0	8.0	9.0	0.25	1.0	1.0	10.0		
No. 3 CWAD	3.5	7.0	40.0	8.0	4 kernels per 1000 g	0.4	3.0	10.0	11.0	0.5	1.0	3.0	20.0		
No. 4 CWAD	10.0	15.0	No minimum	12.0	0.5	1.5	3.0	11.0	12.0	Consider overall appearance					
No. 5 CWAD	15.0	No limit		No limit	5.0	5.0	3.0	13.0	15.0	No limit					

K. Number of kernel-sized pieces in 500 g

* Columns which represent a subtotal of other columns show the columns to be added in parenthesis

The area inside dashed lines refers to factors which are assessed in determining commercial cleanliness.

Total foreign material does not include broken wheat passing through the #5 buckwheat sieve

Wheat, Canada Western Red Winter (CWRW)

Column	Foreign material													
	1	2	3	4	*5 (2 + 3 + 4)	6	7	*8 (2 + 6 + 7)	9	10	11	12	13	*14 (2 + 3 + 4 + 6 + 7 + 10 + 11 + 12 + 13)
	Broken grain through #5 buckwheat sieve %	Small seeds %	Attrition %	Roughage %	Total small seeds, attrition and roughage %	Large seeds %	Wild oats %	Total small seeds, large seeds and wild oats %	Stones %	Mineral matter including stones %	Ergot %	Sclerotinia %	Other cereal grains and other matter %	Total foreign material %
Grade name														
No. 1 CWRW	0.30	0.05	0.10	0.05	0.10	0.20	0.10	0.20	0.03	0.06	0.01	0.01	1.0	1.0
No. 2 CWRW	0.30	0.05	0.10	0.05	0.10	0.20	0.10	0.20	0.06	0.10	0.04	0.04	2.0	2.0
CW Feed	0.50	0.05	0.10	0.10	0.10	0.50	0.10	0.50	0.10	0.25	0.10	0.10	5.0	5.0

Grade name	Wheats of other classes or varieties		Minimum hard vitreous kernels %	Sprouted %	Heated		Shrunken and broken		
	Contrasting classes %	Total %			Binburnt, severely mildewed, rotted, mouldy %	Total %	Shrunken %	Broken %	Total %
No. 1 CWRW	1.0	3.0	50.0	0.5	1 kernel per 1000 g	0.05	3.0	5.0	7.0
No. 2 CWRW	2.5	6.0	No minimum	2.5	2 kernels per 1000 g	0.1	3.0	7.0	9.0
CW Feed	No limit—but not more than 10.0% amber durum			No limit	2.5	2.5	4.0	13.0	15.0

* Columns which represent a subtotal of other columns show the columns to be added in parenthesis. The area inside dashed lines refers to factors which are assessed in determining commercial cleanliness. Total foreign material does not include broken wheat passing through the #5 buckwheat sieve.

Wheat, Canada Western Soft White Spring (CWSWS)

Column	Foreign material													
	1	2	3	4	*5 (2+3+4)	6	7	*8 (2+6+7)	9	10	11	12	13	*14 (2+3+4+6+7 +10+11+12+13)
Grade name	Broken grain through #5 buckwheat sieve %	Small seeds %	Attrition %	Roughage %	Total small seeds, attrition and roughage %	Large seeds %	Wild oats %	Total small seeds, large seeds and wild oats %	Stones %	Mineral matter including stones %	Ergot %	Sclerotinia %	Other cereal grains and other matter %	Total foreign material
No. 1 CWSWS	0.30	0.05	0.10	0.05	0.10	0.20	0.05	0.20	0.03	0.06	0.01	0.01	0.75	0.75
No. 2 CWSWS	0.30	0.05	0.10	0.05	0.10	0.20	0.05	0.20	0.03	0.10	0.02	0.02	1.0	1.0
No. 3 CWSWS	0.30	0.05	0.10	0.05	0.10	0.20	0.05	0.20	0.06	0.10	0.04	0.04	1.5	1.5
CW Feed	0.50	0.05	0.10	0.10	0.10	0.50	0.10	0.50	0.10	0.25	0.10	0.10	5.0	5.0

Grade name	Wheats of other classes or varieties %	Sprouted %	Heated		Shrunken and broken			Smudge and blackpoint		
			Binburnt, severely mildewed, rotted, mouldy %	Total %	Shrunken %	Broken %	Total %	Smudge		Total %
								Penetrated %	Total %	
No. 1 CWSWS	1.5	1.0	1 kernel per 1000 g	0.05	3.0	5.0	7.0	3K	30K	10.0
No. 2 CWSWS	3.0	5.0	2 kernels per 1000 g	0.1	3.0	6.0	8.0	0.5	1.0	15.0
No. 3 CWSWS	5.0	8.0	4 kernels per 1000 g	0.4	3.0	7.0	9.0	1.0	3.0	35.0
CW Feed	No limit—but not more than 10.0% amber durum	No limit	2.5	2.5	4.0	13.0	15.0	No limit	No limit	No limit

K Number of kernel-sized pieces in 500 g

* Columns which represent a subtotal of other columns show the columns to be added in parenthesis
 The area inside dashed lines refers to factors which are assessed in determining commercial cleanliness
 Total foreign material does not include broken wheat passing through the #5 buckwheat sieve

Wheat, Canada Western Extra Strong (CWES)

Column	Foreign material												
	1	2	3	4	*5 (2 + 3 + 4)	6	7	*8 (2 + 6 + 7)	9	10	11	12	13
Grade name	Broken grain through #5 buckwheat sieve %	Small seeds %	Attrition %	Roughage %	Total small seeds, attrition and roughage %	Large seeds %	Wild oats %	Total small seeds, large seeds and wild oats %	Stones %	Mineral matter including stones %	Ergot %	Sclerotinia %	Other cereal grains and other matter %
No. 1 CWES	0.30	0.05	0.10	0.05	0.10	0.20	0.10	0.20	0.03	0.10	0.03	0.03	0.75
No. 2 CWES	0.30	0.05	0.10	0.05	0.10	0.20	0.10	0.20	0.06	0.10	0.06	0.06	1.5
CW Feed	0.50	0.05	0.10	0.10	0.10	0.50	0.10	0.50	0.10	0.25	0.10	0.10	5.0
Grade name	Wheats of other classes or varieties				Sprouted %		Heated		Shrunken and broken				
	Contrasting classes %	Total %			Binburnt, severely mildewed, rotted, mouldy %		Total %		Shrunken %	Broken %	Total %		
No. 1 CWES	1.5	3.0			0.5		4 kernel per 1000 g		3.0	7.0	8.0		
No. 2 CWES	2.5	5.0			2.0		6 kernels per 1000 g		3.0	7.0	8.0		
CW Feed	No limit—but not more than 10.0% amber durum				No limit		2.5		4.0	13.0	15.0		

* Columns which represent a subtotal of other columns show the columns to be added in parenthesis
 The area inside dashed lines refers to factors which are assessed in determining commercial cleanliness
 Total foreign material does not include broken wheat passing through the #5 buckwheat sieve

Wheat, Canada Prairie Spring Red (CPSR)

Column	Foreign material													
	1	2	3	4	*5 (2 + 3 + 4)	6	7	*8 (2 + 6 + 7)	9	10	11	12	13	*14 (2 + 3 + 4 + 6 + 7 + 10 + 11 + 12 + 13)
Grade name	Broken grain through #5 buckwheat sieve %	Small seeds %	Attrition %	Roughage %	Total small seeds, attrition and roughage %	Large seeds %	Wild oats %	Total small seeds, large seeds and wild oats %	Stones %	Mineral matter including stones %	Ergot %	Sclerotinia %	Other cereal grains and other matter %	Total foreign material %
No. 1 CPSR	0.30	0.05	0.10	0.05	0.10	0.20	0.10	0.20	0.03	0.10	0.03	0.03	0.75	0.75
No. 2 CPSR	0.30	0.05	0.10	0.05	0.10	0.20	0.10	0.20	0.03	0.10	0.06	0.06	1.5	1.5
CW Feed	0.50	0.05	0.10	0.10	0.10	0.50	0.10	0.50	0.10	0.25	0.10	0.10	5.0	5.0

Grade name	Wheats of other classes or varieties			Heated		Shrunken and broken		
	Contrasting classes %	Total %	Spouted %	Binburnt, severely mildewed, rotted, mouldy %	Total %	Shrunken %	Broken %	Total %
No. 1 CPSR	3.0	5.0	0.5	4 kernels per 1000 g	0.4	5.0	6.0	9.0
No. 2 CPSR	5.0	10.0	2.0	6 kernels per 1000 g	1.0	5.0	6.0	9.0
CW Feed	No limit-but not more than 10.0% amber durum		No limit	2.5	2.5	4.0	13.0	15.0

* Columns which represent a subtotal of other columns show the columns to be added in parenthesis.
The area inside dashed lines refers to factors which are assessed in determining commercial cleanliness.
Total foreign material does not include broken wheat passing through the #5 buckwheat sieve.

Wheat, Canada Prairie Spring White (CPSW)

Column	Foreign material													
	1	2	3	4	*5 (2+3+4)	6	7	*8 (2+6+7)	9	10	11	12	13	*14 (2+3+4+6+7 +10+11+12+13)
Grade name	Broken grain through #5 buckwheat sieve %	Small seeds %	Attrition %	Roughage %	Total small seeds, attrition and roughage %	Large seeds %	Wild oats %	Total small seeds, large seeds and wild oats %	Stones %	Mineral matter including stones %	Ergot %	Sclerotinia %	Other cereal grains and other matter %	Total foreign material %
No. 1 CPSW	0.30	0.05	0.10	0.05	0.10	0.20	0.10	0.20	0.03	0.10	0.03	0.03	0.75	0.75
No. 2 CPSW	0.30	0.05	0.10	0.05	0.10	0.20	0.10	0.20	0.03	0.10	0.06	0.06	1.5	1.5
CW Feed	0.50	0.05	0.10	0.10	0.10	0.50	0.10	0.50	0.10	0.25	0.10	0.10	5.0	5.0

Grade name	Wheats of other classes or varieties			Sprouted %	Heated		Shrunken and broken		
	Contrasting classes %	Total %			Binburnt, severely mildewed, rotted, mouldy %	Total %	Shrunken %	Broken %	Total %
No. 1 CPSW	3.0	5.0		0.5	4 kernels per 1000 g	0.4	5.0	6.0	9.0
No. 2 CPSW	5.0	10.0		2.0	6 kernels per 1000 g	1.0	5.0	6.0	9.0
CW Feed	No limit—but not more than 10.0% amber durum			No limit	2.5	2.5	4.0	13.0	15.0

* Columns which represent a subtotal of other columns show the columns to be added in parenthesis. The area inside dashed lines refers to factors which are assessed in determining commercial cleanliness. Total foreign material does not include broken wheat passing through the #5 buckwheat sieve.

5. Rye

Determination of commercially clean.....	5-3
Determination of dockage	5-4
Definitions	5-4
Dockage not reported	5-4
Normal cleaning procedures	5-4
Composition of dockage	5-5
Cleaning for grade improvement	5-5
Optional analysis	5-6
Grading	5-7
Important definitions	5-7
Net weight of sample	5-7
Kernel counts	5-7
Hazardous substances in samples	5-7
Representative portion for grading	5-8
Grading factors	5-9
Broken	5-9
Contaminated grain	5-9
Degermed kernels	5-9
Earth pellets	5-9
Ergot	5-9
Excreta	5-10
Fertilizer pellets	5-20
Fireburnt kernels	5-10
Foreign material	5-10
Fusarium damage	5-11
Heated kernels	5-11
Matter other than cereal grains	5-11
Odour	5-11
Other cereal grains, excluding wheat	5-12
Rotted	5-12
Sclerotinia sclerotiorum	5-12
Smudge	5-12
Soft earth pellets	5-12
Sprouted kernels	5-13
Stones	5-13
Treated seed and other chemical substances	5-15
Varieties	5-15
Wheat	5-15
Primary grade determinants tables	5-16
Rye, Canada Western/Canada Eastern (CW/CE)	5-16

Export shipments	5-17
Commercially clean	5-17
Not commercially clean	5-17
Grading	5-17
Export grade determinants tables	5-18
Rye, Canada Western (CW)	5-18

Determination of commercially clean

Dockage is not assessed on rye sample that meet the commercially clean specifications defined in the rye export grade determinant table. All samples must be analyzed to determine if they are commercially clean prior to dockage assessment. The analysis of samples which are **clearly** not commercially clean may consist of a visual assessment. For example, if there is no doubt that a sample contains more than 0.05% of small seeds without hand sieving and weighing the seeds then dockage will be assessed using procedures defined under *Determination of dockage*. Where there is any doubt regarding whether the sample is commercially clean the sample must be analyzed using the procedures outlined in steps 1 through 5 below to confirm that the sample is not commercially clean prior to assessing a dockage.

1. Using a Boerner- type divider, divide the sample to obtain a representative portion of at least 900 grams.
2. Place approximately 250 grams of the sample at a time on the No. 4.5 round hole hand sieve.
3. Move the sieves from left to right 30 times using a sifting motion. One complete motion is approximately 10 cm from the center to one side, back to the center, approximately 10 cm to the other side and back to the center.
4. All material passing through the No. 4.5 round hole sieve is weighed and the percentage calculated to determine if it meets the commercially clean specification of the grade for material removable through the No. 4.5 round hole sieve. (Column #2 in the rye export grade determinant table)
5. Small seeds passing through the No. 4.5 round hole sieve are weighed and the percentage calculated to determine if they meet the commercially clean specification of the grade for small seeds. (Column #1 in the rye export grade determinant table)

Should the percentage concentration of either of the factors determined in steps 1 through 5 exceed the specifications set out in columns 1 or 2 of the rye export grade determinant chart the sample will be considered to be not commercial clean. Dockage will be assessed on samples determined to be not commercially clean by using the procedures defined under *Determination of dockage*.

Determination of dockage

Definitions

Dockage is assessed and recorded to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as “any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain.” Dockage is removed by following the cleaning procedures described in this chapter.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage is assessed in two stages.

1. Follow *Normal cleaning procedures*, using the Carter dockage tester.
2. Follow procedures for *Cleaning for grade improvement*. This cleaning can be done at any time after normal cleaning has been completed.

Dockage not reported

▲ **Important:** Dockage is not reported for samples grading

- *Rye, Sample CW/CE Account Fireburnt*
- *Rye, Sample Salvage*
- *Rye, Sample Condemned*

Normal cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

1. Set up the Carter dockage tester as follows:

Feed control	#5
Air control	Minimum #4
Riddle	No. 25 or No. 1
Top sieve	No. 6 buckwheat
Centre sieve	No. 5 buckwheat
Bottom sieve	No. 5 buckwheat
Sieve cleaner control	Off

2. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
 - Official samples should be at least 900 grams.
 - Unofficial samples should be at least 750 grams.
3. Turn on the Carter dockage tester.
4. Pour the sample into the hopper.

5. After the sample has passed through the machine, turn on the sieve cleaner control for two to three seconds to remove kernels lodged in the sieve.
6. Turn off the dockage tester.
7. Lightly snap the retainer rod of the aspiration pan to loosen material gathered on the air screen.
8. Remove the aspiration pan.
9. Handpick large whole kernels of rye from the portion passing over the riddle and return them to the cleaned sample.
10. Determine dockage. Use the list under *Composition of dockage*.

Composition of dockage

Dockage includes

- Rye with long rootlets removed by the riddle.
For samples of rye which are graded *Rye Sample CW/CE Account Sprouted* any rye with long rootlets that was removed by the riddle will be returned to the sample and not assessed as dockage (See *Sprouted*)
- Material other than rye removed by the No. 25 riddle
- Material removed by aspiration
- Material that passes through the bottom No. 5 buckwheat Carter sieve
- A maximum of 10% soft earth pellets handpicked from the clean sample
- Material removed by *Cleaning for grade improvement*

Cleaning for grade improvement

If the grade of a sample can be improved by additional cleaning, perform the cleaning and add the additional material to dockage. Cleaning for grade improvement can be done at any time after normal cleaning.

Procedures are summarized in the table which follows.

1. Sieve the sample using the No. 6 buckwheat hand sieve.

▲ Important: When you use a hand sieve, move the sieve from left to right 30 times, using a sifting motion. One time is one complete motion from the centre, to one side, to the other side, and back to the centre. The total distance from left to right is 20 cm, about eight inches.

2. Weigh the additional dockage and add it to the original dockage.

Cleaning for grade improvement—Rye

Material to be removed	Equipment	Effect on composition of dockage
Broken kernels	No. 6 buckwheat hand sieve	<p>If the weight of broken kernels is over the grade tolerance but is</p> <ul style="list-style-type: none"> • Less than 5% of the gross weight, add to dockage • 5% or more of the gross weight, broken kernels become a grading factor. Return them to the cleaned sample. <p>See <i>Broken kernels</i>.</p>

**Optional
analysis**

Where a shipper requests special cleaning of a carlot of grain at a terminal or transfer elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported and elevator stocks will be adjusted on the basis of the analysis. Agreement of the shipper and unload elevator must be conveyed to the CGC in writing prior to the analysis being performed.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
 - The percentage by gross weight to the nearest 0.1% and the grade of rye.
 - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
 - The percentage of dockage.

Example

95.0% Rye, No. 1 CW

4.0% Domestic Mustard Seed, No. 1 CAN Oriental

1.0% dockage

Grading

Important definitions

Net weight of sample	The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the cleaned sample, or the net weight.
Kernel counts (K)	<p>The kernel count is the number of kernel-sized pieces in 500 gram sample.</p> <ul style="list-style-type: none">• To do kernel counts, you must have 500 grams of cleaned sample.• All grading is done on representative portions divided down from the cleaned sample using a Boerner-type divider.
Hazardous substances in samples	Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide or desiccant."

Representative portion for grading

All grading is done on representative portions divided down from the cleaned sample, using a Boerner-type divider.

When concentration of the grading factor is . . .	Then use . . .
Low	Optimum portion size
High	Minimum portion size or more (do not use less)

Values in this table represent a range of recommended portion sizes.

Representative portion of rye for grading, grams

Grading factor	Minimum	Optimum	Export
Broken	50	100	100
Ergot	500	1000	1000
Excreta	working sample	working sample	working sample
Fireburnt	500	working sample	working sample
Fusarium damage	10	100	100
Heated	50	100	100
Matter other than cereal grains	50	100	250
Odour	working sample	working sample	working sample
Other cereal grains, excluding wheat	50	100	250
Sclerotinia sclerotiorum	500	1000	1000
Smudge	working sample	working sample	working sample
Soft earth pellets	working sample	working sample	working sample
Sprouted	10	50	50
Stones	250	1000	1000
Wheat	50	100	250

Grading factors

Broken (BKN)

Broken kernels are pieces of rye that are less than three-quarters of a whole kernel.

- If the broken kernel has been chewed by insects, it is also considered as broken for grading purposes as long as no mould is evident on the exposed endosperm.
- If the broken kernel has mould on exposed endosperm, it is graded relative to the degree of soundness.

Representative portion for analysis

Minimum—50 g

Optimum—100 g

Export—100 g

Procedures

- In samples graded *Rye, Sample CW/CE Account Broken or Rye, Sample Broken Grain*, handpick any broken rye removed in cleaning but remaining on top of the No. 4.5 round-hole hand sieve. Return it to the cleaned sample.
- For reporting and grading, round down the percentage by weight of broken rye in the cleaned sample to a whole number; for example, 4.9% becomes 4%.

Contaminated grain

▲ Important: Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the “*Canada Grain Act*” as: “Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*.”

Determination as to whether grain is contaminated will be made by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada. Samples deemed to be contaminated are graded *Rye, Sample Condemned*.

Degermed kernels (DGM)

Degermed kernels

- Are considered *Sprouted* if the sample contains other sprouted kernels
- Are considered sound if the sample contains no other sprouted kernels

Earth pellets (EP)

- Hard earth pellets are pellets that do not crumble under light pressure.
See Stones.
- Soft earth pellets are pellets that crumble under light pressure.
See Soft earth pellets.

Ergot (ERG)

Ergot is a plant disease producing elongated fungal bodies that have a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.

Representative portion for analysis

Minimum—500 g

Optimum—1000 g

Export—1000 g

Procedures

- Determine the weight of ergot as a percentage of the net weight of the sample.

**Excreta
(EXCR)**

- ▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Representative portion for analysisMinimum—working
sampleOptimum—working
sampleExport—working
sample**Fertilizer
pellets
(FERT PLTS)**

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysisMinimum—working
sampleOptimum—working
sampleExport—working
sample**Procedures**

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Rye, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

**Fireburnt
kernels
(FBNT)**

Fireburnt kernels are charred or scorched by fire. A cross-section of a fireburnt kernel resembles charcoal with numerous air holes. The air holes result in a low-weight kernel which crumbles easily under pressure.

Representative portion for analysis

Minimum—500 g

Optimum—working
sampleExport—working
sample**Foreign
material
(FM)**

Foreign material in rye includes all material other than whole or broken rye that remains in the sample after the removal of dockage.

Fusarium damage (FUS DMG)

Fusarium-damaged kernels in rye are chalk-like in appearance and frequently have a fibrous growth in the kernel crease. Rye has a shallow crease and therefore the fibrous growth is frequently removed during handling.

Representative portion for analysis

Minimum—10 g

Optimum—100 g

Export—100 g

Procedures

Separate all kernels showing any evidence of fusarium damage, including any kernels that have a chalk-like appearance. Apply the following guidelines.

Fusarium-damaged kernels includes

- Chalk-like kernels in combination with a fibrous mould
- Chalk-like kernels without the fibrous mould if the mould is present on other chalk-like kernels in the sample

Do not include

- Chalk-like kernels without the fibrous mould if there are no other chalk-like kernels with mould in the sample

Heated kernels (HTD)

Heated kernels are red or orange, and have the odour typical of grain that has deteriorated in storage or has been damaged by artificial drying. Heated rye is not easily detected because of the natural colour variations that occur in sound rye.

Rotted kernels are included in the tolerance for *Heated*.

Representative portion for analysis

Minimum—50 g

Optimum—100 g

Export—100 g

Matter other than cereal grains (MOTCG)

Matter other than cereal grains includes the following material remaining in the cleaned sample:

- Seeds such as ragweed, Tartary buckwheat, rye grass, wild oats
- Non-cereal domestic grains such as flaxseed, corn, peas, buckwheat or lentils

Representative portion for analysis

Minimum—50 g

Optimum—100 g

Export—250 g

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

Representative portion for analysis

Minimum—working sample

Optimum—working sample

Export—working sample

If odour is the grade determinant and there is . . .	Then the grade is . . .
A distinct objectionable odour not associated with the quality of the grain, but not heated or fireburnt	<i>Rye, Sample CWICE Account Odour</i>
A distinct heated odour	<i>Rye, Sample CWICE Account Heated</i>
A distinct fireburnt odour	<i>Rye, Sample CWICE Account Fireburnt</i>

Other cereal grains excluding wheat (OCGXWHT)

Other cereal grains, excluding wheat in rye are barley, triticale, oats and groats, including wild oat groats. For oats, see *Machine separation*. For wheat, see *Wheat*.

Representative portion for analysis

Minimum—50 g Optimum—100 g Export—250 g

Rotted (ROT)

See *Heated*.

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, and have a dark black exterior, a pure white interior, and a coarse surface texture.

Representative portion for analysis

Minimum—500 g Optimum—1000 g Export—1000 g

Smudge (SM)

Smudge describes the discolouration caused by disease. The dark kernels often found in rye are similar in appearance to wheat kernels which has been affected by blackpoint or smudge.

Representative portion for analysis

Minimum—working sample Optimum—working sample Export—working sample

Procedures

When grading, consider the incidence and severity of the discolouration. There is no specific numeric tolerance. This factor is considered under *Degree of soundness*, as defined in the Primary Grade Determinants tables.

Soft earth pellets (SEP)

Soft earth pellets are

- Earth pellets that crumble into fine dust under light pressure, using a finger only—if they do not crumble, they are considered *Stones*
- Any non-toxic material of similar consistency

Representative portion for analysisMinimum—working
sampleOptimum—working
sampleExport—working
sample**Procedures**

1. Handpick soft earth pellets from a representative portion of the cleaned sample.
2. Soft earth pellets constituting 10.0% or less of the sample are assessed as dockage.
3. Where soft earth pellets represent more than 10% of the net weight, the sample is graded *Rye, Sample CW/CE Account Admixture*.

**Sprouted
kernels
(SPTD)**

Sprouted kernels show definite signs of germination.

- ▲ **Important:** Kernels with long rootlets which clean out over the No. 25 or No. 1 riddle are either
- Included in dockage, as described in *Composition of dockage*
 - Returned to the sample and become a grading factor, in samples graded *Rye, Sample CW/CE, Account Sprouted*

Representative portion for analysis

Minimum—10 g

Optimum—50 g

Export—50 g

**Stones
(STNS)**

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Representative portion for analysis

Minimum—500 g

Optimum—1000 g

Export—1000 g

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.
 - In western Canada samples of grain containing stones in excess of “basic grade” tolerances, up to 2.5% are graded *Rye, Rejected “basic grade” Account Stones*. The “basic grade” refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
 - In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Rye, Sample Canada Eastern/Can Account Stones*.
 - In western and eastern Canada grain containing more than 2.5% stones is graded *Rye, Sample Salvage*.

Examples: Western Canada

Excerpt from grade determinant tables for
Rye, Canada Western

*Grade name	Stones %
No. 1 CW	0.033
No. 2 CW	0.033
No. 3 CW	0.066

* Defined in the *Canada Grain Regulations*

Basic grade: *Rye, No. 2 CW*

Reason for basic grade: *Mildew*

If the above sample contained	Grade in western Canada
0.05% stones	<i>Rye, Rejected No. 2 CW Account Stones</i>
1.0% stones	<i>Rye, Rejected No. 2 CW Account Stones</i>
3.0% stones	<i>Rye, Sample Salvage</i>

Examples: Eastern Canada

Excerpt from grade determinant tables for
Rye, Canada Eastern

*Grade name	Stones
No. 1 CE	3K
No. 2 CE	3K
No. 3 CE	5K

* Defined in the *Canada Grain Regulations*

K Number of kernel-sized pieces in 500 g

Basic grade: *Rye, No. 2 CE*

Reason for basic grade: *Mildew*

If the above sample contained	Grade in eastern Canada
4K stones	<i>Rye, No. 3 CE</i>
10K stones	<i>Rye, Sample CE Account Stones</i>
3.0% stones	<i>Rye, Sample Salvage</i>

**Treated seed
and other
chemical
substances**
Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals—pink or red, canola—baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Rye, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction “*Suspected Contaminated Grain, Handling Procedures*” for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances

Varieties

Rye is graded without reference to variety.

**Wheat
(WHT)**

Wheat is considered foreign material in rye.

Representative portion for analysis

Minimum—50 g

Optimum—100 g

Export—250 g

Primary grade determinants tables

Rye, Canada Western/Canada Eastern (CW/CE)

*Grade name	Standard of quality			Damage				
	*Minimum test weight kg/hL (g/0.5 L)	*Variety	*Degree of soundness	Broken %	Fireburnt %	Fusarium %	Heated %	Sprouled %
No. 1 CW/CE	72.0 (349)	Any variety of rye equal to acceptable reference varieties	Well matured, practically free from weather-damaged kernels	4.0	Nil	0.25	0.1	0.5
No. 2 CW/CE	69.0 (334)	Any variety of rye equal to acceptable reference varieties	Reasonably well matured, reasonably free from weather-damaged kernels	5.0	Nil	0.5	0.75	2.0
No. 3 CW/CE	63.0 (304)	Any variety of rye	Excluded from higher grades on account of damaged kernels	8.0	Nil	1.0	5.0	10.0
Grade, when No. 3 specs not met	Rye, Sample CW/CE Account Light Weight			50.0% or less—Rye, Sample CW/CE Account Broken Grain Over 50.0%—Sample Broken Grain	Rye, Sample CW/CE Account Fireburnt	Rye, Sample CW/CE Account Fusarium Damage	Rye, Sample CW/CE Account Heated	Rye, Sample CW/CE Account Sprouled

*Grade name	Foreign material							
	*Cereal grains other than wheat %	*Ergot %	Excreta %	*Matter other than cereal grains %	Sclerotinia %	Stones %		*Total %
No. 1 CW/CE	1.5	0.05	0.01	0.5	0.05	CW	CE	2.0
No. 2 CW/CE	3.0	0.2	0.01	1.0	0.10	0.033	3K	5.0
No. 3 CW/CE	10.0	0.33	0.02	2.0	0.25	0.066	5K	10.0
Grade, when No. 3 specs not met	See Mixed grain	Rye, Sample CW/CE Account Ergot	Rye, Sample CW/CE Account Excreta	Rye, Sample CW/CE Account Admixture	Rye, Sample CW/CE Account Admixture	2.5% or less—Rye, Rejected (grade) Account Stones Over 2.5%—Rye, Sample Salvage	2.5% or less—Rye, Sample CE Account Stones Over 2.5%—Rye, Sample Salvage	See Mixed grain

* Defined in the Canada Grain Regulations Schedule III Table X and Table XXXIX

K Number of kernel-sized pieces in 500 g

Export shipments

Export shipments can be commercially clean or not commercially clean.

Commercially clean

Shipments are defined as commercially clean when meeting the commercially clean specifications listed in the export grade determinant table upon following the *Determination of commercially clean* procedures described in this chapter.

No dockage is reported for samples representing commercially clean rye.

Not commercially clean (NCC)

Shipments that do not meet the standards for commercial cleanliness are referred to as not commercially clean. Such shipments are permitted only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal and transfer elevators, dockage is reported to the nearest 0.1%, less a deduction of up to 0.2% to take into account the buildup of attritional material.

Grading

Rye on export is graded using standard samples and export specifications. Where there are no export specifications, the primary specifications are used.

Export grade determinants tables

Rye, Canada Western (CW)

Grade name	Removable material through 4.5 round-hole sieve		Foreign material										Heated %	Sprouted %
	(1) Small seeds %	(2) Total %	Large seeds %	Wild oats %	Total %	Cereal grains other than wheat %	Ergot %	Mineral matter		Sclerotinia %	Total foreign material, including wheat %			
								Stones %	Total mineral matter %					
No. 1 CW	0.05	0.10	0.10	0.10	0.15	1.5	0.05	0.033	0.066	0.05	2.0	0.05	0.5	
No. 2 CW	0.05	0.10	0.15	0.10	0.20	3.0	0.20	0.033	0.10	0.10	5.0	0.35	2.0	
No. 3 CW	0.05	0.10	0.25	0.15	0.25	10.0	0.33	0.066	0.15	0.25	10.0	2.0	10.0	

The area inside dashed lines refers to factors which are assessed in determining commercial cleanliness.

6. Barley

Classes, types and varieties	6-3
Classes	6-3
Malting	6-3
Hulless	6-3
General purpose	6-3
Types	6-3
Two-row barley	6-3
Six-row barley	6-3
Barley of other types	6-3
Varieties	6-4
Eligible varieties	6-4
Non-registered varieties	6-4
Inferior varieties	6-4
Determination of commercially clean.....	6-5
Determination of dockage	6-6
Definitions	6-6
Dockage not reported	6-6
Normal cleaning procedures	6-6
Composition of dockage	6-7
Cleaning for grade improvement	6-7
Optional analysis	6-8
Grading	6-9
Important definitions	6-9
Net weight of sample	6-9
Kernel counts	6-9
Hazardous substances in samples	6-9
Representative portion for grading	6-10
Grading factors	6-11
Adhered hulls	6-11
Barley of other types	6-11
Broken	6-11
Contaminated grain	6-11
Covered smut and false loose smut	6-11
Earth pellets	6-12
Ergot	6-12
Excreta	6-12
Fertilizer pellets	6-13
Fireburnt	6-13
Frost	6-13
Fusarium mould	6-14
Heated	6-14
Inseparable seeds	6-14
Mildew	6-15
Odour	6-15

Other cereal grains	6-15
Peeled and broken	6-15
Plump and thin kernels	6-16
Rotted kernels	6-17
Sclerotinia sclerotiorum	6-17
Severely mildewed	6-17
Smut	6-17
Soft earth pellets	6-17
Sprouted	6-17
Stones	6-18
Test weight	6-20
Thin kernels	6-20
Treated seed and other chemical substances	6-21
Varieties with adhered hulls	6-22
Weathered	6-22
Wild oats	6-22
Primary grade determinants tables	6-23
Barley, Canada Western/Canada Eastern malting (CW/CE)	6-23
Barley, Canada Western/Canada Eastern hulless (CW/CE)	6-25
Barley, Canada Western/Canada Eastern general purpose (CW/CE)	6-27
Export shipments	6-29
Export grade determinants tables	6-30

Classes, types and varieties

Classes

Barley is divided into three classes based on end use, malting, hulless and general purpose.

Malting

Malting barley is a dual purpose barley. If production cannot be sold at a premium for malting and brewing, then it is used for livestock feed. Only about 20 percent of malting barley production is actually *selected* for malting each year. The other 80 percent is used domestically as livestock feed or exported as feed barley. Registered feed barley is not suitable for malting and brewing, and can be used only for livestock feed.

There are three malting grades, *Special Select*, *Select*, and *Standard*. Barley selected for malting that does not qualify for one of these grades is graded *Barley, Sample Select CW/CE, Two-row/Six-row Account "Factor"*.

Hulless

Hulless barley is used primarily for animal feed, mostly for swine, but it is also marketed for human consumption. Hulless varieties have a very loose hull which is usually removed during harvesting.

There are two hulless grades, *Select* and *Standard*. Hulless barley *not selected* may be assigned only to the standard or general purpose grades.

General purpose

General purpose grades include barley not selected for malting and hulless barley not qualifying for *Standard CW/CE Hulless*.

Types

Two-row barley A head of two-row barley contains two rows of kernels along its length.

Six-row barley A head of six-row barley contain six rows of kernels along its length, in two groups of three kernels each.

Barley of other types In two-row barley, barley of other types is any six-row variety. In six-row barley, barley of other types is any two-row variety.

Varieties**Eligible varieties**

	Grade	Eligible varieties
Malting	Special Select and Select CW/CE Two-row	Any two-row variety of barley equal to or better than Harrington for malting purposes
	Special Select and Select CW/CE Six-row	Any six-row variety of barley equal to or better than B1602 for malting purposes
	Standard Select CW/CE Two-row/Six-row	Any two-row/six-row variety of barley equal to or better than Harrington/B1602 for malting purposes.
Hulless	Select CW/CE Two-row	Any two-row hulless variety of barley equal to or better than reference varieties
	Select CW/CE Six-row	Any six-row hulless variety of barley equal to or better than reference varieties
	Standard CW/CE	Any acceptable hulless reference variety of barley
General purpose	No. 1 CW/CE	Any variety or type of barley or combination of varieties or types
	No. 2 CW/CE	Any variety or type of barley or combination of varieties or types

Non-registered varieties

Non-registered varieties are eligible for Barley No. 2 CW/CE and lower.

Inferior varieties

An inferior variety is any variety of the same type of barley that is not equal to the varietal standard or reference variety.

Determination of commercially clean

All samples must be analyzed to determine if they are commercially clean prior to dockage assessment. The analysis of samples, that are **clearly** not commercially clean, may consist of a visual assessment. For example, if there is no doubt that a sample contains more than 0.1% of small seeds without passing the sample over the Carter dockage tester as set up below and weighing the small seeds, then primary dockage assessment procedures can be followed. Where there is any doubt regarding whether the sample is commercially clean, the sample must be analysed using the procedures outlined in steps 1 through 4 below to confirm that the sample is not commercially clean prior to assessing a dockage.

1. Using a Boerner-type divider, divide the sample to obtain a representative portion of at least 900 grams.
2. Pass the sample over the Carter dockage tester set up as follows:

Feed control	5
Air control	3
Riddle	None
Top sieve	No. 4.5 round-hole
Centre sieve	Blank tray
Bottom sieve	None
Sieve cleaner control	Off

3. Small seeds passing through the No. 4.5 round-hole sieve are weighed and the percentage calculated to determine if they meet the commercially clean specification of the grade for small seeds. (Column #1 in the Barley Export grade determinant table)
4. All material passing through the No. 4.5 round-hole sieve is combined with dust and chaff removed by aspiration and the percentage calculated to determine if they meet the commercially clean specification of the grade for Total small seeds, attrition, dust and chaff. (Column #2 in the Barley Export grade determinant table)

Should the percentage concentration of either of the factors determined in steps 1 through 4 exceed the specifications set out in columns 1 or 2 of the barley export grade determinant table, the sample will be considered to be not commercially clean. Dockage will be assessed on samples determined to be not commercially clean by following the procedures defined under *Determination of dockage*.

Determination of dockage

Definitions

Dockage is assessed to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as “any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain.” Dockage is removed by following the cleaning procedures described in this section of the guide.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage is assessed in two stages.

1. Follow *Normal cleaning procedures*, using the Carter dockage tester.
2. Follow procedures for *Cleaning for grade improvement*. This cleaning can be done at any time after normal cleaning has been completed.

Dockage not reported

▲ **Important:** Dockage is not reported for samples grading

- Barley, Sample CW/CE, Account Fireburnt
- Barley, Sample Salvage
- Barley, Sample Condemned

Normal cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

1. Set up the Carter dockage tester as follows:

Feed control	#5
Air control	No. 6
Riddle	No. 6
Top sieve	No. 6 buckwheat
Centre sieve	No. 5 buckwheat
Bottom sieve	Blank tray
Sieve cleaner	Off

2. Divide the uncleaned sample to obtain a representative portion.
 - Official samples should be at least 900 grams.
 - Unofficial samples must be at least 750 grams.

3. Turn on the Carter dockage tester.
4. Pour the sample into the hopper.
5. After the sample has passed through the machine, turn on the sieve cleaner control for 2 to 3 seconds to remove kernels lodged in the sieve.
6. Turn off the dockage tester.
7. Lightly snap the retainer rod of the aspiration pan to loosen material gathered on the air screen.

▲ **Important:** These are the normal settings. Ensure when you aspirate general purpose barley that you do not move light weight barley from the sample.

If the aspirated material contains lightweight barley,

1. Return the material to the sample.
 2. Reset the Carter dockage tester with a lower air setting to remove only lightweight dockage material.
 3. Pass it through the Carter dockage tester again.
8. Remove the aspiration pan.
 9. Determine dockage, using the list under *Composition of dockage*.

Composition of dockage

Dockage includes

- Material removed over the No. 6 riddle
- Lightweight material removed by aspiration
- Material that is removed by the No. 5 buckwheat Carter sieve
- A maximum of 10% of soft earth pellets handpicked from the clean sample
- Material removed by *Cleaning for grade improvement*

Cleaning for grade improvement

If the grade of a sample can be improved by additional cleaning, perform the cleaning and add the additional material to dockage. Cleaning for grade improvement can be done at any time after normal cleaning.

1. After normal cleaning, examine the material to be removed and select your equipment according to the material you want to remove. See the table *Cleaning for grade improvement—Barley* for the list of equipment.
2. Sieve the sample by hand, or pass it through the Carter dockage tester, depending on the material.

▲ **Important:** When you use a hand sieve, move the sieve from left to right 30 times, using a sifting motion. One time is one complete motion from the centre, to one side, to the other side, and back to the centre. The total distance from left to right is 20 cm, about eight inches.

3. Weigh the additional dockage and add it to the original dockage.

Cleaning for grade improvement—Barley

Material to be removed	Equipment	Effect on composition of dockage
Large seeds	No. 6 buckwheat hand sieve	Large seeds are <ul style="list-style-type: none"> • Seeds that do not pass through the No. 4.5 round-hole sieve • Grains other than cereal grains, such as peas, beans, corn, flaxseed and domestic buckwheat • Ragweed and Tartary buckwheat Assess material as dockage, provided the grade is improved and not more than 5.0% of barley is removed.
Covered smut and false loose smut	Carter dockage tester, set up for <i>Normal cleaning procedures</i> , with air control set to 7	If the percentage by weight of material removed is <ul style="list-style-type: none"> • Less than 2.0% of the gross weight of the sample, add to dockage • 2.0% or more of the gross weight of the sample, the sample is sent to the Chief Grain Inspector for review
Wild oats, shrunken barley and rye grass	No. 9x9 wire hand sieve	For malting and the select hulless grades, wild oats, shrunken barley and rye grass that exceed the grade tolerance are included in dockage.
Attached awns	Hand rub Carter dockage tester for aspiration	Removes awns Separates detached awns from working sample. Awns removed to be included in dockage.

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal or transfer elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported and elevator stocks will be adjusted on the basis of the analysis. Agreement of the shipper and unload elevator must be conveyed to the CGC in writing prior to the analysis being performed.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
 - The percentage by gross weight to the nearest 0.1% and the grade of barley.
 - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
 - The percentage of dockage.

Example

95.0% Barley, No. 1 CW

4.0% Domestic Mustard Seed, No. 1 CAN Oriental

1.0% dockage

Grading

Important definitions

Net weight of sample	The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the cleaned sample, the net weight.
Kernel counts (K)	<p>The kernel count is the number of kernel-sized pieces in a 500 gram sample.</p> <ul style="list-style-type: none">• To do kernel counts, you must have 500 g of cleaned sample.• All grading is done on representative portions divided down from the cleaned sample using a Boerner-type divider.
Hazardous substances in samples	Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide or desiccant."

Representative portion for grading

All grading is done on representative portions divided down from the cleaned sample, using a Boerner-type divider.

When the concentration of the grading factor is . . .	Then use . . .
Low	Optimum portion size
High	Minimum portion size or more (do not use less)

Values in this table represent a range of recommended portions of samples for grading.

Representative portion of barley for grading, grams

Grading factor	Minimum	Optimum	Export
Adhered hulls	100	250	250
Barley of other types	10	10	10
Broken	25	50	50
Covered smut and false loose smut	working sample	working sample	working sample
Ergot	500	1000	1000
Excreta	working sample	working sample	working sample
Fireburnt	500	working sample	working sample
Frost	25	100	100
Fusarium damage	25	100	100
Heated	25	100	100
Inseparable seeds — malting and hullless	100	working sample	working sample
Inseparable seeds — general purpose	100	100	100
Odour	working sample	working sample	working sample
Other cereal grains	50	100	250
Peeled and broken	50	100	100
Plump and thin	250	250	250
Rotted kernels	50	250	100
Sclerotinia sclerotiorum	500	1000	1000
Severe mildew	50	100	100
Soft earth pellets	working sample	working sample	working sample
Sprouted	25	25	25
Stones	500	1000	1000
Varieties with adhered hulls	50	100	250
Weathered	working sample	working sample	working sample
Wild oats	50	100	250

Grading factors

Adhered hulls (ADHULLS) Adhered hulls are kernels of hulless varieties with hulls that have not been removed during harvesting. See *Varieties with adhered hulls*.

Representative portion for analysis

Minimum—100 g Optimum—250 g Export—250 g

Barley of other types (BOOT) In two-row barley, barley of other types is any six-row variety. In six-row barley, barley of other types is any two-row variety.

Representative portion for analysis

Minimum—10 g Optimum—10 g Export—10 g

Broken (BKN) Broken kernels are pieces that are less than three-quarters of a whole kernel and kernels with the germ end broken off.

Representative portion for analysis

Minimum—25 g Optimum—50 g Export—50 g

Contaminated grain ▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the “*Canada Grain Act*” as: “Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*.”

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Barley, Sample Condemned*.

Covered smut and false loose smut (SMUT) There are no specific numeric tolerances for smut. In evaluating smut as a grading factor, consider

- The degree of smut tag on the kernels
- The number of pieces of covered smut left in the cleaned sample

Representative portion for analysis

Minimum—working sample Optimum—working sample Export—working sample

If the sample . . .	Then the grade is . . .		
	Malting	Hulless	General purpose
Contains about 5K of covered smut and no tagged kernels	<i>Barley, Select CW/CE Two-row/Six-row</i>	<i>Barley, Standard CW/CE Hulless</i>	<i>Barley, No. 1 CW/CE</i>
Contains many pieces of covered smut and smut-tagged kernels	<i>Barley, Standard Select CW/CE Two-row/Six-row</i>	<i>Barley, Sample CW/CE Hulless, Account Smut</i>	<i>Barley, No. 2 CW/CE</i>
Is severely contaminated	<i>Barley, Sample CW/CE Two-row/Six-row, Account Smut</i>	<i>Barley, Sample CW/CE Hulless, Account Smut</i>	<i>Barley, Sample CW/CE, Account Smut</i>

Earth pellets (EP)

- Hard earth pellets are pellets that do not crumble under light pressure.
See *Stones*.
- Soft earth pellets are pellets that crumble under light pressure.
See *Soft earth pellets*.

Ergot (ERG)

Ergot is a plant disease producing elongated fungus bodies with a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.

Representative portion for analysis

Minimum—500 g

Optimum—1000 g

Export—1000 g

Procedures

For *CE* and *CW* hulless grades

- If the number of ergot pieces is not excessive, determine the kernel count.
- If the number of ergot pieces is excessive, determine the weight of stones as a percentage of the net weight of the sample.

For all other *CW* grades

Determine the weight of ergot as a percentage of the net weight of the sample.

Excreta (EXCR)

- ▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Representative portion for analysis

Minimum—working sample

Optimum—working sample

Export—working sample

**Fertilizer pellets
(FERT PLTS)**

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Barley, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction “*Suspect Contaminated Grain, Handling Procedures*” for procedures to be followed when handling samples containing fertilizer pellets.

**Fireburnt
(FBNT)**

Fireburnt kernels charred or scorched by fire. A cross-section of a fireburnt kernel resembles charcoal with numerous air holes. The air holes result in a low weight kernel which crumbles easily under pressure.

Representative portion for analysis

Minimum—500 g

Optimum—working
sample

Export—working
sample

**Frost
(FR)**

For varieties with hulls—frost-damaged kernels have distinctly indented backs, and usually a loose hull. Kernels with a light wrinkling from frost are not considered frost-damaged.

For hullless varieties—frost-damaged kernels have severe wrinkling and translucent endosperms.

▲ **Important:** Determine frost-damaged kernels and *Peeled and broken* prior to sizing the sample. Sizing tends to peel kernels.

Representative portion for analysis

Minimum—25 g

Optimum—100 g

Export—100 g

Procedures—Malting and hullless grades

1. Use a representative portion of at least 25 grams of the cleaned sample.
2. Determine the percentage of frost-damaged kernels.

**Fusarium
mould
(FUS MLD)**

Fusarium-damaged kernels of barley are discoloured by pink, orange or black encrustations of fusarium mould. Under magnification, the black encrustations appear raised above the surface of the kernel and are surrounded by a white mould. The black encrustations can be scraped off.

Some degree of judgment is required when identifying kernels with the fusarium mould. Only those kernels which meet this description are to be designated as fusarium damaged.

Representative portion for analysis

Minimum—25 g

Optimum—100 g

Export—100 g

Procedures

Confirm the presence of fusarium mould using a 10-power magnifying lens.

**Heated
(HTD)**

Heated kernels have the colour or odour typical of grain that has deteriorated in storage or has been damaged by artificial drying. The hull over the germ of the heated kernels often appears discoloured, usually to a golden brown.

Representative pearled portion for analysis

Minimum—25 g

Optimum—100 g

Export—100 g

Procedures

A representative portion of the cleaned sample is passed through a barley pearler for up to 10 seconds. When the hull is removed by pearling the germ appears red or brown. As the degree of heat damage increases, a greater portion of the pearled kernel exhibits the red discolouration.

**Inseparable
seeds
(INSEP SDS)**

Inseparable seeds are those not removed by the cleaning process, usually large seeds. See *Glossary*.

Representative portion for analysis—malting and hulless grades

Minimum—100 g

Optimum—working
sampleExport—working
sample**Representative portion for analysis—general purpose grades**

Minimum—100 g

Optimum—100 g

Export—100 g

Procedures

- Assess as dockage if they are removed by *Cleaning for grade improvement*.
- Malting and hulless grades may not contain any large oil-bearing seeds such as sunflower seeds, safflower seeds or soybeans.

**Mildew
(MIL)**

Mildew is a fungal condition that develops in unthreshed grain usually under conditions of excessive moisture. The affected kernels are grayish in colour and lower in quality. In the evaluation of mildew, consider the number of affected kernels and their severity. See *Severe mildew*.

**Odour
(ODOR)**

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

If odour is the grade determinant and there is ...	Then the grade is ...
A distinct, objectionable odour, not associated with the quality of the grain, but not heated or fireburnt	<i>Barley, Standard Select CW/CE Two-row/Six-row Barley, Sample CW/CE Hulless Account Odour Barley, Sample CW/CE Account Odour</i>
A distinct, heated odour	<i>Barley, Standard Select CW/CE Two-row/Six-row Barley, Sample CW/CE Hulless Account Heated Barley, Sample CW/CE Account Heated</i>
A distinct, fireburnt odour	<i>Barley, Standard Select CW/CE Two-row/Six-row Barley, Sample CW/CE Hulless Account Fireburnt Barley, Sample CW/CE Account Fireburnt</i>

**Other cereal
grains
(OCG)**

Other cereal grains include wheat, rye, oats or triticale remaining in the cleaned sample.

Representative portion for analysis

Minimum—50 g

Optimum—100 g

Export—250 g

**Peeled
and broken
(PLD BKN)**

Peeled kernels are kernels with at least one of the following characteristics:

- One-third or more of the hull is removed, including kernels of hulless barley
- The germ is fully exposed
- The hull is badly frayed or ruptured over the germ end without evidence of germination
- The hull is removed along both edges.

Broken kernels are pieces of kernels that are less than three-quarters of a whole kernel and kernels with the germ end broken off.

▲ **Important:** Determine peeled and broken and frost-damaged kernels prior to sizing the sample. Sizing tends to peel kernels.

Representative portion for analysis

Minimum—50 g

Optimum—100 g

Export—100 g

Plump and thin kernels (PLMP, THIN)

The process for determining plump and thin kernels is called sizing.

- Plump kernels are kernels that remain on top of or lodged in the No. 6 slotted sieve. These are a grading factor for malting barley only.
- Thin kernels are kernels that pass through the No. 5 slotted sieve. These are a grading factor for malting and hullless barley.

▲ **Important:** Determine frost-damaged kernels and peeled and broken prior to sizing the sample. Sizing tends to peel kernels.

Procedures

1. Using a Boerner-type divider, divide a representative portion of not less than 250 grams from the cleaned sample.
2. Set the Carter dockage tester as follows:

Feed control	#5
Air control	Off
Riddle	None
Top sieve	No. 6 slotted
Centre sieve	No. 5 slotted
Bottom sieve	Blank tray
Sieve cleaner control	Off

3. Pass the representative portion through the Carter dockage tester once.
4. When most of the sample has passed over the sieves, turn on the sieve cleaner control for five kicks of the machine to loosen lodged kernels.

▲ **Important:** Do not rap sieves in the machine to loosen lodged kernels.

5. Remove each sieve carefully from the machine.
6. Remove lodged kernels from each sieve. Add them to the barley that passed over that sieve.
7. Weigh separately
 - Plump kernels on top of or lodged in No. 6 slotted sieve
 - Thin kernels that passed through the No. 5 slotted sieve

Representative portion for analysis

Minimum—250 g

Optimum—250 g

Export—250 g

Rotted kernels (ROT KRNL) Rotted kernels are discoloured, swollen, soft and spongy as a result of decomposition by fungi or bacteria. Consider rotted kernels in combination with severely mildewed and heated.

Representative portion for analysis

Minimum—50 g

Optimum—250 g

Export—100 g

Sclerotinia sclerotiorum (SCL) *Sclerotinia sclerotiorum* is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, and have a dark black exterior, a pure white interior and a coarse surface texture.

Representative portion for analysis

Minimum—500 g

Optimum—1000 g

Export—1000 g

Severely mildewed (SEVMIL) Severe mildew refers to kernels that are severely blackened by mildew. See *Mildew*. Consider severe mildew in combination with rotted and heated kernels.

Representative portion for analysis

Minimum—50 g

Optimum—100 g

Export—100 g

Smut See *Covered smut and false loose smut*.

Soft earth pellets (SEP) Soft earth pellets are

- Earth pellets that crumble into fine dust under light pressure, using a finger only—if they do not crumble, they are considered *Stones*.
- Any non-toxic material of similar consistency

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

Procedures

1. Handpick soft earth pellets from a representative portion of the cleaned sample.
2. Soft earth pellets constituting 10.0% or less of the sample are assessed as dockage.
3. Where soft earth pellets represent more than 10% of the net weight, the sample is graded *Barley, Sample CW/CE Account Admixture*.

Sprouted (SPTD) Sprouted kernels show definite signs of germination.

Procedures for malting grades

1. Select a representative portion of not less than 25 grams.
2. Pass the sample through the pearler for two or three seconds.
3. Analyse the lightly pearled sample for evidence of germination.

General purpose grades

Analyse without pearling.

Representative portion for analysis

Minimum—25 g

Optimum—25 g

Export—25 g

**Stones
(STNS)**

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Representative portion for analysis

Minimum—500 g

Optimum—1000 g

Export—1000 g

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
 2. Determine stone concentration in the net sample.
- In western Canada samples of grain containing stones in excess of “basic grade” tolerances, up to 2.5% are graded *Barley, Rejected “basic grade” Account Stones*. The “basic grade” refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
 - In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Barley, Sample Canada Eastern/Can Account Stones*.
 - In western and eastern Canada grain containing more than 2.5% stones is graded *Barley, Sample Salvage*.

Examples: Western Canada

Excerpt from grade determinant tables for
Barley, CW Hulless

*Grade name	Stones
Select CW Two-row Hulless	2K
Select CW Six-row Hulless	2K
Standard CW Hulless	5K

* Defined in the *Canada Grain Regulations*

K Number of kernel-sized pieces in 500 g

Basic grade:*Barley, Select CW Two-row Hulless*

Reason for basic grade:*Stained*

If the above sample contained	Grade in western Canada
4K stones	<i>Barley, Rejected Select CW Two-row Hulless Account Stones</i>
10K stones	<i>Barley, Rejected Select CW Two-row Hulless Account Stones</i>
3.0% stones	<i>Barley, Sample Salvage</i>

Examples: Eastern Canada

Excerpt from grade determinant tables for
Barley, CE Hulless

*Grade name	Stones
Select CE Two-row Hulless	2K
Select CE Six-row Hulless	2K
Standard CE Hulless	5K

* Defined in the *Canada Grain Regulations*

K Number of kernel-sized pieces in 500 g

Basic grade: *Barley, Select CE Two-row Hulless*

Reason for basic grade: *Stained*

If the above sample contained	Grade in eastern Canada
4K stones	<i>Barley, Standard CE Hulless</i>
10K stones	<i>Barley, Sample CE Hulless Account Stones</i>
3.0% stones	<i>Barley, Sample Salvage</i>

Test weight (TWT)

Test weight is the weight of a measured volume of grain expressed in kilograms per hectolitre. If a barley sample contains kernels with attached awns that reduce the test weight and affect the grade, see procedures for *Cleaning for grade improvement*.

Thin kernels (THIN)

The process of determining the percentage by weight of thin kernels is called sizing. For sizing of malting barley, see *Plump and thin kernels*.

Thin kernels are kernels that pass through the No. 5 slotted sieve. These are a grading factor for malting and hulless barley.

▲ **Important:** Determine frost-damaged kernels and peeled and broken first. Then size the sample. Sizing tends to peel kernels.

For hulless grades only—the general appearance of the sample and factors other than size are taken into account in grading. Samples scant in sizing requirements but otherwise sound are given the benefit of the doubt in grading.

Representative portion for analysis

Minimum—250 g

Optimum—250 g

Export—250 g

Procedures

1. Obtain a representative portion of not less than 250 grams of the cleaned sample.
2. Set up the Carter dockage tester as follows:

Feed control	#5
Air control	Off
Riddle	None
Top sieve	None
Centre sieve	No. 5 slotted
Bottom sieve	Blank tray
Sieve cleaner control	Off

3. Run the representative portion through the Carter dockage tester once.
4. When the bulk of the sample has passed over the sieves, turn on the sieve cleaner control for only five kicks of the machine to loosen lodged kernels.

▲ Important: Do not rap sieves in the machine to loosen lodged kernels.

5. Weigh thin kernels that pass through the No. 5 slotted sieve

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals—pink or red, canola—baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ Important: Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Barley, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction “*Suspected Contaminated Grain, Handling Procedures*” for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Varieties with adhered hulls

For select hulless barley—varieties with adhered hulls are considered as *Other cereal grains*.

For standard hulless barley—varieties with adhered hulls are any kernels of non-hulless varieties.

Representative portion for analysis

Minimum—50 g

Optimum—100 g

Export—250 g

Weathered (WEATH)

Weathered kernels are discoloured by weathering to a very deep yellow or light brown. Severely weathered kernels are severely discoloured. They may be dark brown, heavily stained or distinctly bleached and may also be mildewed. Consider the number of affected kernels and their condition when you assess the general colour of the sample.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

Wild oats (WO)

Wild oats is an annual grassy weed. The seeds vary in colour from white to black. They are normally more slender than domestic oats, and have a slanting, circular depressed scar, sometimes called a sucker mouth, at the base, and a bent twisted awn.

Representative portion for analysis

Minimum—50 g

Optimum—100 g

Export—250 g

Primary grade determinants tables

Barley, Canada Western/Canada Eastern Malting (CW/CE)

Grade name	Standard of quality				Damage					
	*Minimum test weight kg/hL (g/0.5 L)	*Variety	*Degree of soundness	Barley of other types %	Fireburnt %	Frost %	Fusarium %	Heated, rotted, severely mildewed %	Peeled and broken %	Sprouted %
Special Select CW/CE Two-row	63.0 (303)	Any two-row variety of barley equal to or better than Harrington for malting purposes	Reasonably sound, fairly well matured, may be moderately weather-stained, but not severely discoloured	1.0	Nil	0.2	Nil	Nil	4.0	Nil
Special Select CW/CE Six-row	62.0 (298)	Any six-row variety of barley equal to or better than B1602 for malting purposes	Reasonably sound, fairly well matured, may be moderately weather-stained, but not severely discoloured	1.0	Nil	0.2	Nil	Nil	4.0	Nil
Select CW/CE Two-row	61.0 (293)	Any two-row variety of barley equal to or better than Harrington for malting purposes	Fairly sound, may be slightly immature and moderately weather-stained or discoloured	3.0	Nil	1.0	0.2	Nil	6.0	0.5
Select CW/CE Six-row	60.0 (288)	Any six-row variety of barley equal to or better than B1602 for malting purposes	Fairly sound, may be slightly immature and moderately weather-stained or discoloured	3.0	Nil	1.0	0.2	Nil	6.0	0.5
Standard Select CW/CE Two-row/Six-row	-	Any two row or any six-row variety of barley equal to or better than Harrington or B1602, respectively, for malting purposes	Excluded from other grades of malting quality barley on account of weather-staining or discolouration	-	-	-	0.2	-	-	-
Grade if specs for Standard Select CW/CE Two-row/Six-row not met	NA	NA	NA	NA	NA	NA	Barley, Sample CW/CE Two-row/Six-row Account Fusarium Damage	NA	NA	NA

* Defined in the Canada Grain Regulations Schedule III Table VIII and Table XXXVII

Note: Only barley accepted for malting purposes may be graded into the 'Select' grades. Barley not accepted for malting will be graded according to quality into the 'General Purpose' grades

Barley, Canada Western/Canada Eastern Maltng (CW/CE), continued

*Grade name	Sizing		Foreign material									
	Plump %	Thin %	Ergot %		Excreta %	*Inseparable seeds %	*Other cereal grains %	Sclerotinia %	Stones %		*Wild oats %	*Total %
			CW	CE					CW	CE		
Special Select CW/CE Two-row	85.0	3.0	Nil	Nil	0.01	0.2 Free of large oil-bearing seeds	1.0	0.01	0.02	2K	0.2	1.0
Special Select CW/CE Six-row	75.0	4.0	Nil	Nil	0.01	0.2 Free of large oil-bearing seeds	1.0	0.01	0.02	2K	0.2	1.0
Select CW/CE Two-row	80.0	3.0	0.025	1K	0.01	0.2 Free of large oil-bearing seeds	1.0	0.01	0.02	2K	0.5	1.5
Select CW/CE Six-row	70.0	4.0	0.025	1K	0.01	0.2 Free of large oil-bearing seeds	1.0	0.01	0.02	2K	0.5	1.5
Standard Select CW/CE Two-row/Six-row	-	-	-	-	0.01	0.2 Free of large oil-bearing seeds	-	-	-	-	-	-
Grade if specs for Standard Select CW/CE Two-row/Six-row not met	NA	NA	NA	NA	Barley Sample Select CW/CE Two-row/Six-row Account Excreta	Barley Sample Select CW/CE Two-row/Six-row Account Admixture	NA	NA	NA	NA	NA	NA

* Defined in the *Canada Grain Regulations* Schedule III Table VIII and Table XXXVII

K Number of kernel-sized pieces in 500 g

Note: Only barley accepted for malting purposes may be graded into the "Select" grades. Barley not accepted for malting will be graded according to quality into the "General Purpose" grades.

Barley, Canada Western/Canada Eastern Hulless (CW/CE)

	Standard of quality						Damage				
	*Minimum test weight kg/ha (g/0.5 l)	*Variety	*Varieties with adhered hulls %	*Other hullless varieties %	*Total adhered hulls %	*Degree of soundness	Broken %	Fireburnt %	Frost %	Heated, rotted, severely mildewed %	Sprouted %
*Grade name Select CWICE Two-row Hullless	75.0 (360)	Any two-row hullless variety of barley equal to or better than reference varieties	Considered as other cereal grains	5.0	5.0	Fairly sound, may be slightly immature and moderately weather-stained or discoloured	4.0	Nil	2.0	0.2	0.5
Select CWICE Six-row Hullless	74.0 (355)	Any six-row hullless variety of barley equal to or better than reference varieties	Considered as other cereal grains	5.0	5.0	Fairly sound, may be slightly immature and moderately weather-stained or discoloured	4.0	Nil	2.0	0.2	0.5
Standard CWICE Hullless	72.0 (346)	Any variety of hullless barley	15.0	-	15.0	Reasonably sweet may be frost-damaged, weather-stained or otherwise damaged	15.0	Nil	-	0.5	10.0
Grade, if Standard specs not met	Barley, Sample CWICE Hullless Account Light Weight		50% or less- Barley, Sample CWICE Hullless Account Adhered Hulls		Barley, Sample CWICE Hullless Account Adhered Hulls		Barley, Sample Broken Grain	Barley, Sample CWICE Hullless Account Fireburnt		Barley, Sample CWICE Hullless Account Heated	Barley, Sample CWICE Hullless Account Sprouted

* Defined in the Canada Grain Regulations Schedule III Table IX.1 and Table XXXVIII.1

K Number of kernel-sized pieces in 500 g

Barley, Canada Western/Canada Eastern Hulless (CW/CE), continued

	Sizing		Foreign material							*Total %
	Thin %	Ergot %	Excreta %	*Inseparable seeds %	*Other cereal grains %	Sclerotinia %	Stones %	*Wild oats %		
*Grade name										
Select CW/CE Two-row Hulless	5.0	3K	0.01	0.2 Free of large oil-bearing seeds	1.0	0.01	2K	0.5	1.0	
Select CW/CE Six-row Hulless	5.0	3K	0.01	0.2 Free of large oil-bearing seeds	1.0	0.01	2K	0.5	1.0	
Standard CW/CE Hulless	-	0.05	0.02	0.2	3.0	0.01	5K	1.0	3.0	
Grade, if Standard specs not met		Barley, Sample CW/CE Hulless Account Ergot	Barley, Sample CW/CE Hulless Account Excreta	Barley, Sample CW/CE Hulless Account Admixture	50% or less—Mixed Grain, CW/CE Barley	Barley, Sample CW/CE Hulless Account Admixture	2.5% or less—Barley, Rejected (grade) Account Stones or Barley, Sample CE Hulless Account Stones Over 2.5%— Barley, Sample Salvage	50% or less—Mixed Grain, CW/CE Barley	50% or less—Mixed Grain, CW/CE Barley	

* Defined in the Canada Grain Regulations Schedule III Table IX.1 and Table XXXVIII.1

K Number of kernel-sized pieces in 500 g

Barley, Canada Western/Canada Eastern General Purpose (CW/CE)

*Grade name	Standard of quality			*Degree of soundness	Damage				
	*Minimum test weight kg/hi (g/0.5 l)		*Variety		Broken %	Fireburnt %	Fusarium %	Heated, rotted, severely mildewed %	Sprouted %
	CW	OE							
No. 1 CW/CE	63.0 (303)	60.0 (288)	Any variety or type of barley or combination of varieties or types	Reasonably sweet, may be frost- damaged, weather-stained or otherwise damaged	15.0	Nil	1.0	1.0	10.0
No. 2 CW/CE	57.0 (274)	54.0 (260)	Any variety or type of barley or combination of varieties or types	Fairly sweet, excluded from other grades of barley on account of immature or severely damaged kernels	25.0	0.5	1.0	10.0	20.0
Grade, if No. 2 specs not met	Barley, Sample CW Account Light Weight	Barley, Sample CE Account Light Weight			Barley, Sample CW/CE Broken Grain	Barley, Sample CW/CE Account Fireburnt	Barley, Sample CW/CE Account Fusarium Mould	Barley, Sample CW/CE Account Heated	Barley, Sample CW/CE Account Sprouted

* Defined in the Canada Grain Regulations Schedule III Table IX and Table XXXVIII

Barley, Canada Western/Canada Eastern General Purpose (CW/CE), continued

*Grade name	Foreign material								*Total %
	Ergot %	Excreta %	*Inseparable seeds %	*Other cereal grains %	Sclerotinia %	Stones %		*Wild oats %	
No. 1 CW/CE	0.05	0.02	0.2	2.5	0.01	CW	CE	1.0	2.5
No. 2 CW/CE	0.10	0.02	0.2	8.0	0.01	0.15	5K	2.5	10.0
Grade, if No. 2 specs not met	Barley, Sample CW/CE Account Ergot	Barley, Sample CW/CE Account Excreta	Barley, Sample CW/CE Account Admixture	50% or less—Mixed Grain CW/CE Barley	Barley, Sample CW/CE Account Admixture	2.5% or less—Barley, Rejected (grade) Account Stones Over 2.5%—Barley, Sample Salvage	2.5% or less—Barley, Sample CE Account Stones Over 2.5%—Barley, Sample Salvage	50% or less—Mixed Grain CW/CE Barley	50% or less—Mixed Grain CW/CE Barley

* Defined in the Canada Grain Regulations Schedule III Table IX and Table XXXVIII

K Number of kernel-sized pieces in 500 g

Export shipments

Export shipments can be commercially clean or not commercially clean.

Commercially clean

Shipments are defined as commercially clean when meeting the commercially clean specifications listed in the export grade determinant table upon following the *Determination of commercially clean* procedures described in this chapter.

No dockage is reported for samples representing commercially clean barley.

Not commercially clean (NCC)

Shipments that do not meet the standards for commercial cleanliness are referred to as *not commercially clean*. Such shipments are possible only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal and transfer elevators, dockage is reported to the nearest 0.1%, less a deduction of 0.2% to take into account the buildup of attritional material.

Grading

Western malting barley on export is graded using export specifications.

6-30

	Sizing		Damage	
	Pump %	Thin %	Heated %	Peeled and broken %
Grade name				
Special select CW two-row	80.0	4.0	Nil	6.0
Special select CW six-row	70.0	5.0	Nil	6.0
Select CW two-row	75.0	4.0	0.1	7.0
Select CW six-row	65.0	5.0	0.1	7.0
No. 1 CW	No limit	No limit	0.5	15.0 Broken
No. 2 CW			2.5	25.0 Broken

The area inside dashed lines refers to factors which are assessed in determining commercial cleanliness.

7. Oats

Determination of commercially clean	7-3
Determination of dockage	7-4
Definitions	7-4
Dockage not reported	7-4
Normal cleaning procedures	7-4
Composition of dockage	7-5
Cleaning for grade improvement	7-5
Optional analysis	7-6
Grading	7-7
Important definitions	7-7
Net weight of sample	7-7
Kernel counts	7-7
Hazardous substances in samples	7-7
Representative portion for grading	7-8
Grading factors	7-9
Barley	7-9
Cereal grains other than barley and wheat	7-9
Contaminated grain	7-9
Covered smut and false loose smut	7-9
Damage	7-10
Earth pellets	7-10
Ergot	7-10
Excreta	7-11
Fertilizer pellets	7-11
Fireburnt	7-11
Foreign material	7-11
Frost damage	7-11
Fusarium damage	7-12
Green	7-12
Heated	7-12
Hulled and hullless	7-13
Large seeds	7-13
Mildew	7-13
Odour	7-14
Rotted	7-14
Sclerotinia sclerotiorum	7-14
Soft earth pellets	7-14
Sprouted	7-15
Stones	7-15
Total damage and foreign material	7-17
Treated seed and other chemical substances	7-17
Varieties	7-18
Wheat	7-18
Wild oats	7-18

Primary grade determinants tables	7-19
Oats, Canada Western (CW)	7-19
Oats, Canada Eastern (CE)	7-21
Export shipments	7-23
Commercially clean	7-23
Not commercially clean	7-23
Grading	7-23
Export grade determinants tables	7-24
Oats, Canada Western (CW)	7-24

Determination of commercially clean

Dockage is not assessed on oat samples that meet the commercially clean specifications defined in the oats export grade determinant table. All samples must be analyzed to determine if they are commercially clean prior to dockage assessment. The analysis of samples which are **clearly** not commercially clean may consist of a visual assessment. For example, if there is no doubt that a sample contains more than 0.1% of small seeds without hand sieving and weighing the seeds then dockage will be assessed using procedures defined under *Determination of dockage*. Where there is any doubt regarding whether the sample is commercially clean the sample must be analyzed using the procedures outlined in steps 1 through 7 below to confirm that the sample is not commercially clean prior to assessing a dockage.

1. Using a Boerner-type divider, divide the sample to obtain a representative portion of at least 900 grams.
2. Place approximately 250 grams of the sample at a time on the No. 5 buckwheat sieve nested over the No. 4.5 round hole hand sieve.
3. Move the sieves from left to right 30 times using a sifting motion. One complete motion is approximately 10 cm from the center to one side, back to the center, approximately 10 cm to the other side and back to the center.
4. All material passing through the No. 4.5 round hole sieve is weighed and the percentage calculated to determine if it meets the commercially clean specification of the grade for material removable through the No. 4.5 round hole sieve. (Column # 1 in the oat export grade determinant table)
5. Small seeds passing the No. 4.5 round hole sieve are weighed and the percentage calculated to determine if they meet the commercially clean specification of the grade for small seeds. (Column #2 in the oat export grade determinant table)
6. Large seeds removable by the No. 5 buckwheat sieve are weighed and the percentage calculated to determine if they meet the commercially clean specification of the grade for large seeds removable by the No. 5 buckwheat sieve. (Column #3 in the oat export grade determinant table) (See definition of large seeds in *Glossary*)
7. The percentages of material through the No. 4.5 round hole sieve and large seeds removable by the No. 5 buckwheat sieve are added together to determine if they meet the commercially clean specification for total removable material. (Column #4 in the oat export grade determinant table)

Should the percentage concentration of any of the factors determined in steps 1 through 7 exceed the specifications set out in columns 1 to 4 of the oat export grade determinant table the sample will be considered to be not commercial clean. Dockage will be assessed on samples determined to be not commercially clean by using the procedures defined under *Determination of dockage*.

Determination of dockage

Definitions

Dockage is assessed and recorded to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as “any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain.” Dockage is removed by following the cleaning procedures described in this chapter.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage is assessed in two stages.

1. Follow *Normal cleaning procedures*, using the Carter dockage tester.
2. Follow procedures for *Cleaning for grade improvement*. This cleaning can be done at any time after normal cleaning has been completed.

Dockage not reported

▲ **Important:** Dockage is not reported for samples grading

- *Oats, Sample CW/CE, Account Fireburnt*
- *Oats, Sample Salvage*
- *Oats, Sample Condemned*

Normal cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

1. Set up the Carter dockage tester as follows:

Feed control	#5
Air control	#3
Riddle	No. 6
Top sieve	No. 6 buckwheat
Centre sieve	No. 5 buckwheat
Bottom sieve	Blank tray
Sieve cleaner control	Off

2. Divide the uncleaned sample to obtain a representative portion.
 - Official samples should be at least 900 grams.
 - Unofficial samples should be at least 750 grams.
3. Turn on the Carter dockage tester.

4. Pour the sample into the hopper.
5. After the sample has passed through the machine, turn on the sieve cleaner control for two to three seconds to remove kernels lodged in the sieve.
6. Turn off the dockage tester.
7. Lightly snap the retainer rod of the aspiration pan to loosen material gathered on the air screen.

▲ **Important:** These are the normal settings. Ensure when you are aspirating lightweight oats that fully developed, sound oats are not removed from the sample.

If the aspirated material contains whole, sound oats,

1. Return the material to the sample.
 2. Reset the dockage tester with a lower air setting to remove only lightweight dockage material.
 3. Pass it through the Carter dockage tester again.
8. Remove the aspiration pan.
 9. Determine dockage, using the list under *Composition of dockage*.

Composition of dockage

Dockage includes

- Material removed over the No. 6 riddle
- Lightweight material removed by aspiration
- Material that is removed by the No. 5 buckwheat sieve
- A maximum of 10% of soft earth pellets handpicked from the clean sample
- Material removed by *Cleaning for grade improvement*

Cleaning for grade improvement

If the grade of a delivery can be improved by additional cleaning, perform the cleaning and add the additional material to dockage. Cleaning for grade improvement can be done at any time.

1. After normal cleaning, examine the material to be removed and select your equipment according to the material you want to remove. See the table *Cleaning for grade improvement—Oats* for the list of equipment.
2. Sieve the sample by hand, or pass it through the Carter dockage tester, depending on the material.

▲ **Important:** When you use a hand sieve, move the sieve from left to right 30 times, using a sifting motion. One time is one complete motion from the centre, to one side, to the other side, and back to the centre. The total distance from left to right is 20 cm, or about 8 inches.

3. Weigh the additional dockage and add it to the original dockage.

Cleaning for grade improvement—Oats

Material to be removed	Equipment	Effect on composition of dockage
Large seeds	No. 6 buckwheat hand sieve	<p>Large seeds are</p> <ul style="list-style-type: none"> • Seeds that do not pass through the No. 4.5 round-hole sieve • Grains other than cereal grains, such as peas, beans, corn, flaxseed and domestic buckwheat • Ragweed and Tartary buckwheat <p>Assess material as dockage, provided the grade is improved and not more than 5.0% of oats are removed.</p>
Covered smut and false loose smut	Carter dockage tester, set up for <i>Normal cleaning procedures</i> , but with air control set to 7	<p>If the percentage by weight of material removed is</p> <ul style="list-style-type: none"> • Less than 2.0% of the gross weight of the sample, add to dockage • 2.0% or more of the gross weight of the sample, the sample is sent to the Chief Grain Inspector for review.

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal or transfer elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported and elevator stocks will be adjusted on the basis of the analysis. Agreement of the shipper and unload elevator must be conveyed to the CGC in writing prior to the analysis being performed.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
 - The percentage by gross weight to the nearest 0.1% and the grade of oats.
 - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
 - The percentage of dockage.

Example

95.0% Oats, No. 1 CW

4.0% Domestic Mustard Seed, No. 1 CAN Oriental

1.0% dockage

Grading

Important definitions

Net weight of sample	The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the net weight.
Kernel counts (K)	<p>A kernel count is the number of kernel-sized pieces in a 500 gram sample.</p> <ul style="list-style-type: none">• To do kernel counts, you must have 500 grams of cleaned sample.• All grading is done on representative portions divided down from the cleaned sample using a Boerner-type divider.
Hazardous substances in samples	Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as “any pesticide, herbicide or desiccant.”

Representative portion for grading

All grading is done on representative portions divided down from the cleaned sample, using a Boerner-type divider.

When the concentration of the grading factor is . . .	Then use . . .
Low	Optimum portion size
High	Minimum portion size or more (do not use less)

Values in the table represent a range of recommended portion sizes.

Recommended portion of oats for grading, grams

Grading factor	Minimum	Optimum	Export
Barley	25	100	100
Cereal grains other than barley and wheat	25	100	100
Covered smut and false loose smut	working sample	working sample	working sample
Damage	25	25	50
Ergot	500	1000	1000
Excreta	working sample	working sample	working sample
Fireburnt	500	working sample	working sample
Frost damage	5	25	25
Fusarium damage	25	100	100
Green	25	25	50
Heated	25	25	50
Hulled	25	100	100
Large seeds	50	250	250
Mildew	25	25	50
Odour	working sample	working sample	working sample
Rotted	25	100	100
Sclerotinia sclerotiorum	500	1000	1000
Soft earth pellets	working sample	working sample	working sample
Stones	500	1000	1000
Wheat	25	100	100
Wild oats	50	100	500

Grading factors

**Barley
(BLY)**

There is a separate tolerance for barley in oats.

Representative portion for analysis

Minimum—25 g

Optimum—100 g

Export—100 g

**Cereal grains
other than
barley
and wheat**

Cereal grains other than barley and wheat refers to rye and triticale.

Representative portion for analysis

Minimum—25 g

Optimum—100 g

Export—100 g

**Contaminated
grain**

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the “*Canada Grain Act*” as; “Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*.”

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Oats, Sample Condemned*.

**Covered smut
and false
loose smut
(SMUT)**

There are no specific numeric tolerances for smut. In evaluating covered smut as a grading factor, consider

- The degree of smut tag on the kernels
- The number of pieces of covered smut left in the cleaned sample

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

If the sample . . .	Then the grade is . . .
Contains about 5K of covered smut and no tagged kernels	<i>Oats, No. 1 or No. 2 CW/CE</i>
Contains many pieces of covered smut and smut-tagged kernels	<i>Oats, No. 3 CW/CE</i> or <i>Oats, No. 4 CW/CE</i>
Is severely contaminated	<i>Oats, Sample CW/CE Account Smut</i>

**Damage
(DMG)**

Kernels are damaged if the groats are fireburnt, heated, frost-damaged, sprouted, mildewed, green, rotted or affected by fusarium.

Weather staining of the groats is considered damaged if there is significant brown or black discolouration on 50% or more of the groat or the discolouration penetrates into the groat.

Specific tolerances exist for fireburnt, fusarium damage, heated and frost. Other damage is included in *Total damage*.

There is no limit for frost damage in *No. 4 CW Oats*. Frost damage is not included in total damage in *No. 4 CW Oats*.

Representative portion for analysis (hulls removed)

Minimum—25 g

Optimum—25 g

Export—50 g

Determination of damage by mechanical hulling

1. Hull a divided representative portion of the clean sample to yield at least 25 grams of groats.
2. Determine the weight of damaged groats as a percentage of hulled groats.

Determination of damage by manual hulling

Use this method only if a mechanical huller is not available. To determine the percentage by weight of damaged kernels,

1. Divide a representative portion of not less than 5 grams from the cleaned sample.
2. Hull all kernels to establish whether the groats are damaged.
3. To accurately determine the percentage by weight of damaged kernels, weigh the affected groat and the oat hull together.

**Earth pellets
(EP)**

- Hard earth pellets are pellets that do not crumble under light pressure.
See Stones.
- Soft earth pellets are pellets that crumble under light pressure.
See Soft earth pellets.

**Ergot
(ERG)**

Ergot is a plant disease producing elongated fungus bodies that have a purplish-black exterior, a purplish-white to off-white interior, and a relatively smooth surface texture.

Representative portion for analysis

Minimum—500 g

Optimum—1000 g

Export—1000 g

Procedures

Determine the weight of ergot as a percentage of the net weight of the sample.

**Excreta
(EXCR)**

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Representative portion for analysisMinimum—working
sampleOptimum—working
sampleExport—working
sample**Fertilizer
pellets
(FERT PLTS)**

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysisMinimum—working
sampleOptimum—working
sampleExport—working
sample**Procedures**

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Oats, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

**Fireburnt
(FBNT)**

Fireburnt kernels have been charred or scorched by fire. A cross-section of a fireburnt kernel resembles charcoal with numerous air holes. The air holes result in a low weight kernel that crumbles easily under pressure.

Representative portion for analysis

Minimum—500 g

Optimum—working
sampleExport—working
sample**Foreign
material
(FM)**

Foreign material is anything other than oats that remains in the sample after the removal of dockage. Some types of foreign material have separate tolerances.

**Frost
damage
(FR)**

Frost-damaged kernels of oats have a black or sunken ventral side and gray or black groats. Frost-damaged oat groats show discolouration in the ventral crease as a dark line. The discolouration may extend throughout the groats depending on the severity of frost damage.

There is no limit for frost damage in *No. 4 CW Oats*. Frost damage is not included in total damage in *No. 4 CW Oats*.

Representative portion for analysis

Minimum—5 g

Optimum—25 g

Export—25 g

Procedures

Cut the kernels lengthwise through the ventral side and examine the groats to confirm frost damage symptoms.

Fusarium damage (FUS DMG)

Fusarium damage is rare on oats. It resembles fusarium damage in barley. Kernels are discoloured by pink, orange or black encrustations of fusarium mould. Under magnification, the black encrustations appear raised above the surface of the kernel and are surrounded by a white mould. The black encrustations can be scraped off.

Some degree of judgment is required when identifying kernels with the fusarium mould. Only those kernels which meet this description are to be designated as fusarium damaged.

Representative portion for analysis

Minimum—25 g

Optimum—100 g

Export—100 g

Procedures

Confirm the presence of fusarium damage using a 10-power magnifying lens.

Green (GR)

Green kernels in oats are an indication of immaturity.

- Green hulls are assessed in the general colour of the sample.
- Green groats are considered damaged.

Representative portion for analysis

Minimum—25 g

Optimum—25 g

Export—50 g

Procedures

Manually or mechanically hull the appropriate portion and examine the groats for green discolouration. Green groats are assessed as damaged. See *Damage*.

Heated (HTD)

Heated kernels have the colour or odour typical of grain that has deteriorated in storage or has been damaged by artificial drying. When the hull of a heated oat is removed, the groat appears brown or orange-red.

Representative portion for analysis

Minimum—25 g

Optimum—25 g

Export—50 g

Procedures

Manually or mechanically hull the appropriate portion and examine the groats.

If the discolouration affects . . .	The kernel is considered . . .
The entire groat	Heated
Only the germ	Damaged

Hulled and hullless (HULL)

Hulled oats have the hulls removed.

Hullless oats have loose hulls which are usually removed during harvesting.

Groats are the oat kernels without the hulls.

If oats appear to be unprocessed and contain 95.0% or more of a hullless variety,

- Grade the sample according to the primary or export grade specifications except for the tolerances for hulled and hullless kernels.
- Add *hullless* to the grade name, for example, *Oats, No. 1 CW Hullless*.

Representative portion for analysis

Minimum—25 g

Optimum—100 g

Export—100 g

Large seeds (LSDS)

Large seeds are domestic and wild seeds that remain on top of the No. 4.5 round-hole sieve. Large seeds are assessed

- As dockage if they are removed by *Cleaning for grade improvement*
- As large seeds and included in *Total damage and foreign material* if they remain in the sample

Representative portion for analysis

Minimum—50 g

Optimum—250 g

Export—250 g

Mildew (MIL)

Mildew is a fungal condition that develops in unthreshed grain usually under conditions of excessive moisture. The affected kernels are grayish in colour and lower in quality. In the evaluation of mildew, consider the number of affected kernels and their severity.

- Hull discolouration is assessed in the general colour of the sample.
- Discoloured groats are assessed as damaged.

Representative portion for analysis

Minimum—25 g

Optimum—25 g

Export—50 g

Procedures

Manually or mechanically hull the appropriate portion and examine the groats for mildew discolouration. Mildewed groats are assessed as damaged. See *Damage*.

If the discolouration is . . .	The sample is considered . . .
On the groats, from mildew	Damaged
On the hull, but groats are undamaged	Superficially mildewed, but sound

**Odour
(ODOR)**

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

If odour is the grade determinant and there is . . .	Then the grade is . . .
A distinct objectionable odour not associated with the quality of the grain, but not heated or fireburnt	<i>Oats, Sample CW/CE, Account Odour</i>
A distinct heated odour	<i>Oats, Sample CW/CE, Account Heated</i>
A distinct fireburnt odour	<i>Oats, Sample CW/CE, Account Fireburnt</i>

**Rotted
(ROT)**

Rotted kernels are discoloured, swollen, and soft and spongy as a result of decomposition by fungi or bacteria. Rotted kernels in oats are considered as damaged. See *Damage*.

Representative portion for analysis

Minimum—25 g

Optimum—100 g

Export—100 g

**Sclerotinia
sclerotiorum
(SCL)**

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, and have a dark black exterior, a pure white interior and a coarse surface texture.

Representative portion for analysis

Minimum—500 g

Optimum—1000 g

Export—1000 g

**Soft earth
pellets
(SEP)**

Soft earth pellets are

- Earth pellets that crumble into fine dust under light pressure, using a finger only—if they do not crumble, they are considered *Stones*
- Any non-toxic material of similar consistency

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

Procedures

1. Handpick soft earth pellets from a representative portion of the cleaned sample.
2. Soft earth pellets constituting 10.0% or less of the sample are assessed as dockage.
3. Where soft earth pellets represent more than 10% of the net weight, the sample is graded *Oats, Sample CW/CE Account Admixture*.

Sprouted (SPTD)

Sprouted kernels show definite signs of germination. Sprouted oats are assessed as damaged. See *Damage*.

Representative portion for analysis

Minimum—10 g

Optimum—50 g

Export—50 g

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Representative portion for analysis

Minimum—500 g

Optimum—1000 g

Export—1000 g

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
 2. Determine stone concentration in the net sample.
- In western Canada samples of grain containing stones in excess of “basic grade” tolerances, up to 2.5% are graded *Oats, Rejected “basic grade” Account Stones*. The “basic grade” refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
 - In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Oats, Sample Canada Eastern/Can Account Stones*.
 - In western and eastern Canada grain containing more than 2.5% stones is graded *Oats, Sample Salvage*.

Examples: Western Canada

Excerpt from grade determinant tables for
Oats, Canada Western

*Grade name	Stones %
No. 1 CW	0.017
No. 2 CW	0.066
No. 3 CW	0.15
No. 4 CW	0.15

* Defined in the *Canada Grain Regulations*

Basic grade: *Oats, No. 1 CW*

If the above sample contained	Grade in western Canada
0.05% stones	<i>Oats, Rejected No. 1 CW Account Stones</i>
1.0% stones	<i>Oats, Rejected No. 1 CW Account Stones</i>
3.0% stones	<i>Oats, Sample Salvage</i>

Examples: Eastern Canada

Excerpt from grade determinant tables for
Oats, Canada Eastern

*Grade name	Stones
No. 1 CE	1K
No. 2 CE	2K
No. 3 CE	5K
No. 4 CE	5K

* Defined in the *Canada Grain Regulations*

K Number of kernel-sized pieces in 500 g

Basic grade: *Oats, No. 1 CE*

If the above sample contained	Grade in eastern Canada
4K stones	<i>Oats, No. 3 CE</i>
10K stones	<i>Oats, Sample CE Account Stones</i>
3.0% stones	<i>Oats, Sample Salvage</i>

Total damage and foreign material (TDMGFM)

Total damage and foreign material includes all foreign material and all damage. Frost damage is not included in No. 4 CW Oats. When assigning a grade, choose the most appropriate grade as indicated in the table below.

If any one of, or the total of <i>Barley, Cereal grains other than wheat and barley, or Wheat, or Wild oats</i> is...	and <i>Total damage</i> is ...	Then the grade is ...
Above the tolerance	At or below the tolerance	See procedures for <i>Mixed grain</i>
Above or below the tolerance	Above the tolerance	<i>Oats, Sample CW/CE, Account Damage</i>
Individually, each is below the tolerance, but together they exceed the tolerance for <i>Total damage and Foreign Material</i>		<i>Oats, Sample CW/CE, Account Damage and Foreign Material</i>

Treated seed and other chemical substances**Treated seed**

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals—pink or red, canola—baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Oats, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction “*Suspected Contaminated Grain, Handling Procedures*” for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances

Varieties (VAR)	Oats are graded without reference to variety. However, for samples containing 95% or more of a hulless variety, <i>Hulless</i> forms part of the grade name, and tolerances for <i>Hulled and hulless</i> are disregarded.		
----------------------------	--	--	--

Wheat (WHT)	There is a separate tolerance for wheat in oats.		
	Representative portion for analysis		
	Minimum—25 g	Optimum—100 g	Export—100 g

Wild oats (WO)	Wild oats is an annual grassy weed. The seeds vary in colour from white to black. They are normally more slender than domestic oats, and have a slanting, circular depressed scar, sometimes called a sucker mouth, at the base, and a bent twisted awn.		
	Representative portion for analysis		
	Minimum—50 g	Optimum—100 g	Export—500 g

Primary grade determinants tables

Oats, Canada Western (CW)

*Grade name	Standard of quality			Hulled and hullless %	Damage				
	*Minimum test weight kg/hL (g/0.5 L)	*Variety	*Degree of soundness		Fireburnt %	*Frost %	Fusarium %	*Heated %	*Total %
No. 1 CW	56.0 (260)	Any variety of oats equal to acceptable reference varieties	Good colour, 98.0% of groats must be sound	6.0	Nil	0.1	0.1	Nil	2.0
No. 2 CW	53.0 (245)	Any variety of oats equal to acceptable reference varieties	Good colour, 96.0% of groats must be sound	8.0	Nil	4.0	2.0	0.1	4.0
No. 3 CW	51.0 (235)	Any variety of oats equal to acceptable reference varieties	Fair colour, 94.0% of groats must be sound	20.0	Nil	6.0	4.0	0.5	6.0
No. 4 CW	48.0 (220)	Any variety of oats	92.0% of groats must be sound	No limit—if sample contains 95% or more of hullless varieties, hullless becomes part of the grade name	0.25	—	6.0	1.0	8.0
Grade, if No. 4 specs not met	Oats, Sample CW Account Light Weight		Oats, Sample CW Account Damage and Foreign Material		Oats, sample CW Account Fireburnt		Oats, Sample CW Account Fusarium Damaged	Oats, Sample CW Account Heated	Oats, Sample CW Account Damage

* Defined in the Canada Grain Regulations Schedule III Table VII

Oats, Canada Western (CW), continued

	Foreign material										*Total damage and foreign material %
	*Barley %	*Cereal grains other than wheat or barley %	Ergot %	Excreta % 1 piece in 1000 g or less	*Large seeds %	Sclerotinia %	Stones %	*Wheat %	*Wild oats %		
*Grade name											
No. 1 CW	0.75	1.0	Nil		0.2	Nil	0.017	0.75	1.0	2.0	
No. 2 CW	1.5	2.0	0.025	0.01	0.3	0.05	0.066	1.5	2.0	4.0	
No. 3 CW	3.0	3.0	0.025	0.02	0.5	0.05	0.15	3.0	3.0	6.0	
No. 4 CW	8.0	8.0	0.05	0.02	1.0	0.10	0.15	8.0	8.0	8.0	
Grade, if No. 4 specs not met	See Mixed grain	See Mixed grain	Oats, Sample CW Account Ergot	Oats, Sample CW Account Excreta	Oats, Sample CW Account Admixture	Oats, Sample CW Account Admixture	25% or less— Oats, Rejected (grade) Account Stones Over 2.5% — Oats, Sample Salvage	See Mixed grain	50% or less— see Mixed grain Over 50% — Mixed Feed Oats	Oats, Sample CW Account Damage and Foreign Material	

* Defined in the Canada Grain Regulations Schedule III Table VII

Oats, Canada Eastern (CE)

*Grade name	Standard of quality			Hulled and hullless %	Damage			
	*Minimum test weight kg/hL (g/0.5L)	*Variety	*Degree of soundness		Fireburnt %	Fusarium %	*Heated %	*Total %
No. 1 CE	51.0 (235)	Any variety of oats equal to acceptable reference varieties	Well matured, good natural colour, 97.0% of groats must be sound	6.0	Nil	0.1	Nil	0.1
No. 2 CE	49.0 (225)	Any variety of oats equal to acceptable reference varieties	Reasonably well matured, reasonably good natural colour, 96.0% of groats must be sound	8.0	Nil	2.0	0.1	2.0
No. 3 CE	46.0 (210)	Any variety of oats equal to acceptable reference varieties	Fairly well matured, fair colour, 94.0% of groats must be sound	20.0	Nil	4.0	1.0	4.0
No. 4 CE	43.0 (195)	Any variety of oats	66.0% of groats must be sound	No limit—if sample contains 95% or more of hullless varieties, hullless becomes part of the grade name	0.25	6.0	3.0	6.0
Grade, if No. 4 specs not met	Oats, Sample CE Account Light Weight		Oats, Sample CE Account Damage and Foreign Material		Oats, sample CE Account Fireburnt	Oats, Sample CE Account Damaged	Oats, Sample CE Account Heated	Oats, Sample CE Account Damage

* Defined in the Canada Grain Regulations Schedule III Table XXXVI

Oats, Canada Eastern (CE), continued

	Foreign material										*Total damage and foreign material %
	*Barley %	Cereal grains other than wheat or barley %	Ergot %	Excreta %	Large seeds %	Sclerotinia %	Stones %	*Wheat %	*Wild oats %		
*Grade name											
No. 1 CE	1.0	3.0	Nil	1 piece in 1000 g or less	0.2	Nil	1K	1.0	1.0	3.0	
No. 2 CE	2.0	4.0	0.05	0.01	0.3	0.05	2K	2.0	2.0	4.0	
No. 3 CE	6.0	6.0	0.05	0.02	0.5	0.05	5K	6.0	3.0	6.0	
No. 4 CE	14.0	14.0	0.10	0.02	1.0	0.10	5K	14.0	8.0	14.0	
Grade, if No. 4 specs not met	See Mixed grain	See Mixed grain	Oats, Sample CE Account Ergot	Oats, Sample CE Account Excreta	Oats, Sample CE, Account Admixture	Oats, Sample CE Account Admixture	2.5% or less— Oats, Sample CE Account Stones Over 2.5%— Oats, Sample Salvage	See Mixed grain	50% or less— see Mixed grain Over 50%— Mixed Feed Oats	Oats, Sample CE Account Damage and Foreign Material	

* Defined in the *Canada Grain Regulations* Schedule III Table XXXVI

K Number of kernel-sized pieces in 500 grams

Export shipments

Export shipments can be commercially clean or not commercially clean.

Commercially clean

Shipments are defined as commercially clean when meeting the commercially clean specifications listed in the export grade determinant table upon following the *Determination of commercially clean* procedures described in this chapter.

No dockage is reported for samples representing commercially clean oats.

Not commercially clean (NCC)

Shipments that do not meet the standards for commercial cleanliness are referred to as not commercially clean. Such shipments are permitted only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal and transfer elevators, dockage is reported to the nearest 0.1%, less a deduction of up to 0.2% to take into account the buildup of attritional material.

Grading

Western oats on export are graded using export specifications. All other oats are exported using primary specifications.

Export grade determinants tables

Oats, Canada Western (CW)

Grade name	(1) Total material through No. 4.5 round hole sieve %	(2) Small seeds %	(3) Large seeds through No. 5 buckwheat sieve %	(4) (1) + (3) Total removable material %
No. 1 CW	0.2	0.1	0.2	0.2
No. 2 CW	0.2	0.1	0.2	0.2
No. 3 CW	0.2	0.1	0.2	0.2
No. 4 CW	0.2	0.1	0.2	0.2

Grade name	Damage and foreign material									
	Damage			Cereal grains other than wheat or barley %	Ergot %	Large seeds %	Mineral matter		Sclerotinia %	Wheat %
	Frost %	Heated %	Total damage %				Stones %	Total %		
No. 1 CW	0.1	Nil	2.0	1.0	Nil	0.2	0.017	0.033	Nil	0.75
No. 2 CW	4.0	0.1	4.0	2.0	0.025	0.3	0.066	0.066	0.025	1.5
No. 3 CW	6.0	0.5	6.0	3.0	0.025	0.5	0.15	0.25	0.025	3.0
No. 4 CW	No limit	1.0	8.0 excluding frost	8.0	0.05	1.0	0.15	0.25	0.25	8.0
										8.0 excluding frost

The area inside dashed lines refers to factors which are assessed in determining commercial cleanliness.

8. Triticale

Determination of commercially clean.....	8-3
Determination of dockage	8-4
Definitions	8-4
Dockage not reported	8-4
Normal cleaning procedures	8-4
Composition of dockage	8-5
Cleaning for grade improvement	8-5
Optional analysis	8-6
Grading	8-7
Important definitions	8-7
Net weight of sample	8-7
Kernel counts	8-7
Hazardous substances in samples	8-7
Representative portion of triticale for grading, grams	8-8
Grading factors	8-9
Blackpoint	8-9
Broken	8-9
Cereal grains other than wheat	8-9
Contaminated grain	8-9
Degermed	8-9
Earth pellets	8-9
Ergot	8-10
Excreta	8-10
Fertilizer pellets	8-10
Fireburnt	8-10
Foreign material	8-11
Fusarium damage	8-11
Heated	8-11
Matter other than cereal grains	8-11
Odour	8-11
Sclerotinia sclerotiorum	8-12
Smudge	8-12
Soft earth pellets	8-12
Sprouted	8-13
Stones	8-13
Treated seed and other chemical substances	8-15
Varieties	8-15
Primary grade determinants tables	8-16
Triticale, Canada	8-16

Export shipments	8-18
Commercially clean	8-18
Not commercially clean	8-18
Grading	8-18
Export grade determinants tables	8-19
Triticale, Canada	8-19

Determination of commercially clean

Dockage is not assessed on triticale samples that meet the commercially clean specifications defined in the triticale export grade determinant table. All samples must be analyzed to determine if they are commercially clean prior to dockage assessment. The analysis of samples which are **clearly** not commercially clean may consist of a visual assessment. For example, if there is no doubt that a sample contains more than 0.05% of small seeds without hand sieving and weighing the seeds then dockage will be assessed using procedures defined under *Determination of dockage*. Where there is any doubt regarding whether the sample is commercially clean the sample must be analyzed using the procedures outlined in steps 1 through 5 below to confirm that the sample is not commercially clean prior to assessing a dockage.

1. Using a Boerner- type divider, divide the sample to obtain a representative portion of at least 900 grams.
2. Place approximately 250 grams of the sample at a time on the No. 4.5 round hole hand sieve.
3. Move the sieves from left to right 30 times using a sifting motion. One complete motion is approximately 10 cm from the center to one side, back to the center, approximately 10 cm to the other side and back to the center.
4. All material passing through the No. 4.5 round hole sieve is weighed and the percentage calculated to determine if it meets the commercially clean specification of the grade for material removable through the No. 4.5 round hole sieve. (Column #2 in the tritcale export grade determinant table)
5. Small seeds passing through the No. 4.5 round hole sieve are weighed and the percentage calculated to determine if they meet the commercially clean specification of the grade for small seeds. (Column #1 in the triticale export grade determinant table)

Should the percentage concentration of either of the factors determined in steps 1 through 5 exceed the specifications set out in columns 1 or 2 of the triticale export grade determinant table the sample will be considered to be not commercial clean. Dockage will be assessed on samples determined to be not commercially clean by using the procedures defined under *Determination of dockage*.

Determination of dockage

Definitions Dockage is assessed to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as “any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain.” Dockage is removed by the following cleaning procedures described in this section of the guide.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage is assessed in two stages.

1. Follow *Normal cleaning procedures*, using the Carter dockage tester.
2. Follow procedures for *Cleaning for grade improvement*. This cleaning can be done at any time after normal cleaning has been completed.

Dockage not reported

▲ **Important:** Dockage is not reported for samples graded

- *Triticale, Sample Canada Account Fireburnt*
- *Triticale, Sample Salvage*
- *Triticale, Sample Canada Account Admixture*, where all removable material is similar to the admixture
- *Triticale, Sample Condemned*

Normal cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

1. Set up the Carter dockage tester as follows:

Feed control	#6
Air control	#5
Riddle	No. 25
Top sieve	No. 6 buckwheat
Centre sieve	No. 5 buckwheat
Bottom sieve	Blank tray
Sieve cleaner control	Off

2. Divide the uncleaned sample to obtain a representative portion.
 - Official samples should be at least 900 grams.
 - Unofficial samples should be at least 750 grams.
3. Turn on the Carter dockage tester.
4. Pour the sample into the hopper.
5. After the sample has passed through the machine, turn on the sieve cleaner control for two or three seconds to remove kernels lodged in the sieve.
6. Turn off the Carter dockage tester.
7. Lightly snap the retainer rod of the aspiration pan to loosen material gathered on the air screen.
8. Examine the material passing through the No. 5 buckwheat sieve.

If any significant amount of small whole triticale passed through the No. 5 buckwheat sieve, you must resieve this portion over the No. 5 buckwheat hand sieve. Return any triticale remaining on the sieve to the cleaned sample.
9. Handpick sound large kernels of triticale from the portion passing over the riddle and return them to the cleaned sample. Do not pick kernels with long rootlets. See *Composition of dockage and Sprouted*.
10. Determine dockage, using the list under *Composition of dockage*.

Composition of dockage

Dockage includes

- Triticale with long rootlets removed by the riddle.

For samples of triticale which are graded *Triticale Sample CAN Account Sprouted* any triticale with long rootlets that was removed by the riddle will be returned to the sample and not assessed as dockage. (See *Sprouted*)
- A maximum of 10% of soft earth pellets handpicked from the clean sample
- Material other than triticale removed by the No. 25 riddle
- Material removed by aspiration
- Material that has passed through the No. 5 buckwheat Carter sieve
- Material removed by *Cleaning for grade improvement*

Cleaning for grade improvement

If the grade of a delivery can be improved by additional cleaning, perform the cleaning and add the additional material to dockage. Cleaning for grade improvement can be done at any time.

1. Sieve the sample by hand using the appropriate sieve. See the table *Cleaning for grade improvement—Triticale* for the list of sieves.

▲ **Important:** When you use a hand sieve, move the sieve from left to right 30 times, using a sifting motion. One time is one complete motion from the centre, to one side, to the other side, and back to the centre. The total distance from left to right is 20 cm, or about eight inches.

2. Weigh the additional dockage and add it to the original dockage.

Cleaning for grade improvement—Triticale

Material to be removed	Equipment	Effect on composition of dockage
Broken kernels	No. 6 buckwheat hand sieve	If the weight of broken kernels is over the grade tolerance but is <ul style="list-style-type: none"> • Less than 5.0% of the gross weight, add to dockage • 5.0% or more of the gross weight, broken kernels becomes a grading factor. Return them to the cleaned sample. See <i>Broken</i> .
Stones	No. 6 buckwheat hand sieve	If the weight of wheat removed as a percentage of the gross weight of the sample is <ul style="list-style-type: none"> • 5.0% or less, assess as dockage • More than 5.0%, see <i>Stones</i>, or the relevant grade determinants table.
Foreign material	No. 6 buckwheat hand sieve or the No. 9x9 wire hand sieve.	Foreign material includes cockle, wild oats and pin oats.

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal or transfer elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported and elevator stocks will be adjusted on the basis of the analysis.

Agreement of the shipper and unload elevator must be conveyed to the CGC in writing prior to the analysis being performed.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
 - The percentage by gross weight to the nearest 0.1% and the grade of triticale.
 - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
 - The percentage of dockage.

Example

95.0% Triticale, No. 1 CAN

4.0% Domestic Mustard Seed, No. 1 CAN Oriental

1.0% dockage

Grading

Important definitions

Net weight of sample	The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the net weight.
Kernel counts (K)	<p>The kernel count is the number of kernel-sized pieces in a 500 gram sample.</p> <ul style="list-style-type: none">• To do kernel counts you must have 500 grams of cleaned sample.• All grading is done on representative portions divided down from the cleaned sample using a Boemer-type divider.
Hazardous substances in samples	Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as “any pesticide, herbicide or desiccant.”

Representative portion for grading

All grading is done on representative portions divided down from the cleaned sample, using a Boerner-type divider.

When the concentration of the grading factor is . . .	Then use . . .
low	optimum portion size
high	minimum portion size or more (do not use less)

Values in the table represent a range of recommended portion sizes.

Representative portion of triticale for grading, grams

Grading factor	Minimum	Optimum	Export
Broken	50	100	100
Cereal grains other than wheat	50	100	100
Degermed	10	100	100
Ergot	500	1000	1000
Excreta	working sample	working sample	working sample
Fireburnt	500	working sample	working sample
Fusarium damage	10	100	100
Heated	50	100	100
Matter other than cereal grains	100	250	250
Odour	working sample	working sample	working sample
Sclerotinia sclerotiorum	500	1000	1000
Smudge including blackpoint	100	500	500
Soft earth pellets	working sample	working sample	working sample
Sprouted	10	100	100
Stones	500	1000	1000

Grading factors

Blackpoint (BLK PT)	Blackpoint kernels have a distinct dark brown or black discolouration of the whole germ and surrounding area. Disregard a slight discolouration restricted to the germ. See <i>Smudge</i> and <i>Smudge</i> , including <i>blackpoint</i> .
Broken (BKN)	<p>Broken kernels are pieces of triticale that are less than three-quarters of a whole kernel.</p> <p>Representative portion for analysis</p> <p>Minimum—50 g Optimum—100 g Export—100 g</p> <p>Procedures</p> <ul style="list-style-type: none"> • In samples graded <i>Triticale</i>, <i>Sample Broken Grain</i>, return to the cleaned sample any broken triticale removed in cleaning but remaining on top of the No. 4.5 round-hole hand sieve. • For reporting and grading, round down the percentage by weight of broken triticale to a whole number.
Cereal grains other than wheat	<p>Cereal grains other than wheat in triticale includes rye, barley, oats, oat groats and wild oat groats.</p> <p>Representative portion for analysis</p> <p>Minimum—50 g Optimum—100 g Export—100 g</p>
Contaminated grain	<p>▲ Important: Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.</p> <p>Contaminated is defined in the “<i>Canada Grain Act</i>” as; “Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the <i>Food and Drugs Act</i>.”</p> <p>Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded <i>Triticale</i>, <i>Sample Condemned</i>.</p>
Degermed (DGM)	<p>Degermed kernels</p> <ul style="list-style-type: none"> • Are considered <i>Sprouted</i> if the sample contains other sprouted kernels • Are considered sound if the sample contains no other sprouted kernels
Earth pellets (EP)	<ul style="list-style-type: none"> • Hard earth pellets are pellets that do not crumble under light pressure. See <i>Stones</i>. • Soft earth pellets are pellets that crumble under light pressure. See <i>Soft earth pellets</i>.

**Ergot
(ERG)**

- Ergot is a plant disease producing elongated fungus bodies having a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.

Representative portion for analysis

Minimum—500 g

Optimum—1000 g

Export—1000 g

Procedures

- If the amount of ergot is not excessive, determine the kernel count.
- If the kernel count is excessive, determine the weight of ergot as a percentage of the net weight of the sample.

**Excreta
(EXCR)**

- ▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Representative portion for analysisMinimum—working
sampleOptimum—working
sampleExport—working
sample**Fertilizer
pellets
(FERT PLTS)**

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysisMinimum—working
sampleOptimum—working
sampleExport—working
sample**Procedures**

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Triticale, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction “*Suspect Contaminated Grain, Handling Procedures*” for procedures to be followed when handling samples containing fertilizer pellets.

**Fireburnt
(FBNT)**

Fireburnt kernels are kernels charred or scorched by fire. A cross-section of a fireburnt kernel resembles charcoal with numerous air holes. The air holes result in a low weight kernel which crumbles easily under pressure.

Representative portion for analysis

Minimum— 500 g

Optimum—working
sampleExport—working
sample

Foreign material (FM)	Foreign material in triticale includes all material other than whole or broken triticale that remains in the sample after the removal of dockage. Many of the materials have their own separate tolerances.
------------------------------	---

Fusarium damage (FUS DMG)	Fusarium-damaged triticale is typically characterized by thin or shrunken chalk-like kernels. Fusarium-damaged kernels have a white or pinkish fibrous growth which may be visible only under a magnifying lens.
----------------------------------	--

Representative portion for analysis

Minimum—10 g

Optimum—100 g

Export—100 g

Procedures, for severely infested samples

1. Using a Boerner-type divider, divide the representative portion.
 2. Separate all kernels showing any evidence of fusarium damage, including any kernels that have a chalk-like appearance.
 3. You may examine kernels using a 10-power magnifying lens to confirm evidence of a white or pinkish mould or fibrous growth. In determining fusarium damage, use only kernels with this white or pinkish mould or growth.
-

Heated (HTD)	Heated kernels have the colour or odour typical of grain that has deteriorated in storage or has been damaged by artificial drying. Heated triticale is not easily detected because of the natural colour variations that occur in sound triticale. Heated kernels of triticale are red or orange.
---------------------	--

Representative portion for analysis

Minimum—50 g

Optimum—100 g

Export—100 g

Matter other than cereal grains (MOTCG)	Matter other than cereal grains is <ul style="list-style-type: none"> • Inseparable seeds such as ragweed, Tartary buckwheat, rye grass, wild oats • Non-cereal domestic grains such as flaxseed, corn, peas, buckwheat and lentils that remain in the cleaned sample.
--	--

Representative portion for analysis

Minimum—50 g

Optimum—100 g

Export—250 g

Odour (ODOR)	There is no numeric tolerance for odour. Consider <ul style="list-style-type: none"> • The basic quality of the sample • The type and degree of the odour • The presence of visible residue causing the odour
---------------------	--

Representative portion for analysis

Minimum—working sample

Optimum—working sample

Export—working sample

If odour is the grade determinant and there is ...	Then the grade is ...
A distinct objectionable odour not associated with the quality of the grain, but not heated or fireburnt	<i>Triticale, Sample Canada Account Odour</i>
A distinct heated odour	<i>Triticale, Sample Canada Account Heated</i>
A distinct fireburnt odour	<i>Triticale, Sample Canada Account Fireburnt</i>

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, and have a dark black exterior, a pure white interior and a coarse surface texture.

Representative portion for analysis

Minimum—500 g

Optimum—1000 g

Export—1000 g

Procedures

- If the amount of sclerotinia is not excessive, determine the kernel count.
- If the kernel count is excessive, determine the weight of sclerotinia as a percentage of the net weight of the sample.

Smudge (SM)

Smudge is a discolouration on the kernel. The discolouration may be brown, black or red. The discolouration is considered smudge if more than one-half the kernel is discoloured or if the discolouration extends into the crease.

Soft earth pellets (SEP)

Soft earth pellets are

- Earth pellets that crumble into fine dust under light pressure, using a finger only—if they do not crumble, they are considered *Stones*.
- Any non-toxic material of similar consistency.

Representative portion for analysis

Minimum—working sample

Optimum—working sample

Export—working sample

Procedures

1. Handpick soft earth pellets from a representative portion of the cleaned sample.
2. Soft earth pellets constituting 10.0% or less of the sample are assessed as dockage.
3. Where soft earth pellets represent more than 10% of the net weight, the sample is graded *Triticale, Sample CAN Account Admixture*.

**Sprouted
(SPTD)**

Sprouted kernels show definite signs of germination.

Representative portion for analysis

Minimum—10 g

Optimum—100 g

Export—100 g

- ▲ **Important:** Kernels with long rootlets which clean out over the No. 25 riddle are either
- Included in the dockage, as described in *Composition of dockage*
 - Returned to the sample and become a grading factor, in samples graded *Triticale, Sample Canada Account Sprouted*

**Stones
(STNS)**

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Representative portion for analysis

Minimum—500 g

Optimum—1000 g

Export—1000 g

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

Note: Stones may be removed and included in dockage if the the material removed is 5.0% or less of the gross weight of the sample. See *Cleaning for grade improvement*.

- In western Canada samples of grain containing stones in excess of “basic grade” tolerances, up to 2.5% are graded *Triticale, Rejected “basic grade” Account Stones*. The “basic grade” refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Triticale, Sample CAN Account Stones*.
- In western and eastern Canada grain containing more than 2.5% stones is graded *Triticale, Sample Salvage*.

Examples: Western Canada

Excerpt from grade determinant tables for
Triticale, Canada

*Grade name	Stones %
No. 1 Canada	0.033
No. 2 Canada	0.033
No. 3 Canada	0.066

*Defined in the *Canada Grain Regulations*

Basic grade: *Triticale, No. 2 Canada*

Reason for basic grade: Mildew

If the above sample contained	Grade in western Canada
0.05% stones	<i>Triticale, Rejected No. 2 Canada Account Stones</i>
1.0% stones	<i>Triticale, Rejected No. 2 Canada Account Stones</i>
3.0% stones	<i>Triticale, Sample Salvage</i>

Examples: Eastern Canada

Excerpt from grade determinant tables for
Triticale, Canada

*Grade name	Stones %
No. 1 Canada	0.033
No. 2 Canada	0.033
No. 3 Canada	0.066

*Defined in the *Canada Grain Regulations*

Basic grade: *Triticale, No. 2 Canada*

Reason for basic grade: Mildew

If the above sample contained	Grade in eastern Canada
0.05% stones	<i>Triticale, No. 3 Canada</i>
1.0% stones	<i>Triticale, Sample Canada Account Stones</i>
3.0% stones	<i>Triticale, Sample Salvage</i>

Treated seed and other chemical substances**Treated seed**

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals—pink or red, canola—baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Triticale, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction “*Suspected Contaminated Grain, Handling Procedures*” for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances

Varieties

Triticale is graded without reference to variety.

Primary grade determinants tables

Triticale, Canada (CAN)

*Grade name	Standard of quality			Foreign material						
	*Minimum test weight kg/hL (g/0.5 L)	*Variety	*Degree of soundness	*Cereal grains other than wheat %	Ergot %	Excreta %	*Matter other than cereal grains %	Sclerotinia %	Stones %	*Total %
No. 1 Canada	65.0 (315)	Any variety of triticale equal to acceptable reference varieties	Reasonably well matured, reasonably free from damaged kernels	1.0	4K	0.01	0.5	4K	0.033	2.5
No. 2 Canada	62.0 (301)	Any variety of triticale equal to acceptable reference varieties	Fairly well matured, reasonably free from severely damaged kernels	2.0	8K	0.01	1.0	8K	0.033	4.0
No. 3 Canada	-	Any variety of triticale	Reasonably sweet, excluded from higher grades on account of light weight or damaged kernels	3.0	0.1	0.03	2.0	0.1	0.066	7.0
Grade, if No. 3 specs not met				See <i>Mixed grain</i>	<i>Triticale, Sample Canada Account Ergot</i>	<i>Triticale, Sample Canada Account Excreta</i>	<i>Triticale, Sample Canada Account Admixture</i>	<i>Triticale, Sample Canada Account Admixture</i>	2.5% or less— <i>Triticale, Rejected (grade) Account Stones or Triticale, Sample Canada Account</i>	See <i>Mixed grain</i>

* Defined in the *Canada Grain Regulations* Schedule III Table XXIV

K Number of kernel-sized pieces in 500 g

Triticale, Canada (CAN)

*Grade name	Damage					
	Broken %	Fireburnt %	Fusarium %	Heated %	Smudge and blackpoint %	Sprouted %
No. 1 Canada	4.0	Nil	0.25	0.1	10.0	0.5
No. 2 Canada	7.0	Nil	0.5	0.75	15.0	2.0
No. 3 Canada	50.0	Nil	1.0	5.0	—	10.0
Grade, if No. 3 specs not met	Sample Broken Grain	Triticale, Sample Canada Account Fireburnt	Triticale, Sample Canada Account Fusarium Damage	Triticale, Sample Canada Account Heated		Triticale, Sample Canada Account Sprouted

* Defined in the Canada Grain Regulations Schedule III Table XXIV

Export shipments

Export shipments can be commercially clean or not commercially clean. Dockage is not reported for commercially clean shipments.

Commercially clean

Shipments are defined as commercially clean when meeting the commercially clean specifications listed in the export grade determinant table upon following the *Determination of commercially clean* procedures described in this chapter.

No dockage is reported for samples representing commercially clean triticale.

Not commercially clean (NCC)

Shipments that do not meet the standards for commercial cleanliness are referred to as not commercially clean. Such shipments are allowed only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal and transfer elevators, dockage is reported to the nearest 0.1%, less a direct deduction of up to 0.2%.

Grading

Triticale on export is graded using export specifications.

Export grade determinants tables

Triticale, Canada (CAN)

Grade name	Removable material through No. 4.5 round-hole sieve		Foreign material										Damage	
	(1) Small seeds %	(2) Total %	Seeds and wild oats			Cereal grains other than wheat %	Mineral matter		Ergot %	Sclerotinia %	Total foreign material, including wheat %	Sprouted %	Heated %	
			Large seeds %	Wild oats %	Total %		Stones %	Total %						
No. 1 Canada	0.05	0.1	0.2	0.2	0.3	1.0	0.033	0.056	4K	4K	2.5	0.5	0.05	
No. 2 Canada	0.05	0.1	0.4	0.4	0.6	2.0	0.033	0.10	8K	8K	4.0	2.0	0.35	
No. 3 Canada	0.05	0.1	1.0	1.0	1.5	3.0	0.056	0.15	0.10	0.10	7.0	10.0	2.5	

K Number of kernel-sized pieces in 500 g

The area inside dashed lines refers to factors which are assessed in determining commercial cleanliness

9. Mixed grain

Determination of commercially clean	9-2
Determination of dockage	9-3
Definitions	9-3
Dockage not reported	9-3
Composition of mixed grain	9-3
Normal cleaning procedures	9-3
Composition of dockage	9-4
Cleaning for grade improvement	9-4
Optional analysis	9-5
Grading	9-5
Important definitions	9-6
Net weight of sample	9-6
Kernel counts	9-6
Hazardous substances in samples	9-6
Representative portion for grading	9-6
Grading factors	9-7
Broken	9-7
Contaminated grain	9-7
Earth pellets	9-7
Ergot	9-7
Excreta	9-7
Fertilizer pellets	9-7
Fireburnt	9-8
Heated)	9-8
Large seeds	9-8
Odour	9-8
Sclerotinia sclerotiorum	9-9
Soft earth pellets	9-9
Stones	9-10
Treated seed and other chemical substances	9-12
Primary grade determinants tables	9-14
Mixed Grain, Canada Western (CW)	9-14
Mixed Grain, Canada Eastern (CE)	9-15
Export shipments	9-16
Commercially clean	9-16
Not commercially clean	9-16
Grading	9-16
Export grade determinants tables	9-17
Mixed Grain, Canada Western/Canada Eastern (CW/CE)	9-17

Determination of commercially clean

Dockage is not assessed on mixed grain samples that meet the commercially clean specifications defined in the mixed grain export grade determinant table. All samples must be analyzed to determine if they are commercially clean prior to dockage assessment. The analysis of samples which are **clearly** not commercially clean may consist of a visual assessment. For example, if there is no doubt that a sample contains more than 0.1% of small seeds without hand sieving and weighing the seeds then dockage will be assessed using procedures defined under *Determination of dockage*. Where there is any doubt regarding whether the sample is commercially clean the sample must be analyzed using the procedures outlined in steps 1 through 5 below to confirm that the sample is not commercially clean prior to assessing a dockage.

1. Using a Boerner- type divider, divide the sample to obtain a representative portion of at least 900 grams.
2. Place approximately 250 grams of the sample at a time on the No. 4.5 round-hole hand sieve.
3. Move the sieves from left to right 30 times using a sifting motion. One complete motion is approximately 10 cm from the center to one side, back to the center, approximately 10 cm to the other side and back to the center.
4. All material passing through the No. 4.5 round-hole sieve is weighed and the percentage calculated to determine if it meets the commercially clean specification of the grade for material removable through the No. 4.5 round hole sieve. (Column #2 in the mixed grain export grade determinant table)
5. Small seeds passing through the No. 4.5 round hole sieve are weighed and the percentage calculated to determine if they meet the commercially clean specification of the grade for small seeds. (Column #1 in the mixed grain export grade determinant table)

Should the percentage concentration of either of the factors determined in steps 1 through 5 exceed the specifications set out in columns 1 or 2 of the mixed grain export grade determinant table the sample will be considered to be not commercial clean. Dockage will be assessed on samples determined to be not commercially clean by using the procedures defined under *Determination of dockage*.

Determination of dockage

Definitions

Dockage is assessed and recorded to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as “any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain.” Dockage is removed by following the cleaning procedures described in this section of the guide.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage is assessed in two stages.

1. Follow *Normal cleaning procedures*, using the Carter dockage tester.
2. Follow procedures for *Cleaning for grade improvement*. This cleaning can be done at any time after normal cleaning has been completed.

Dockage not reported

▲ **Important:** Dockage is not reported for samples grading

- *Mixed Grain, Sample CW/CE Account Fireburnt*
- *Mixed Grain, Sample Salvage*
- *Mixed Grain, Sample Condemned*

Composition of mixed grain

Mixed grain consists of any mixture of wheat, rye, barley, oats, triticale, wild oats and domestic or wild oat groats which is excluded from other established grades on account of such mixtures.

▲ **Important:** When a sample is to be graded as mixed grain, return dockage to the cleaned sample, and begin *Normal cleaning procedures* described in this section.

Normal cleaning procedures

1. Set up the Carter dockage tester as follows:

Feed control	6
Air control	Minimum 4
Riddle	No. 6
Top sieve	No. 6 buckwheat
Centre sieve	No. 5 buckwheat
Bottom sieve	No. 4.5 round-hole
Sieve cleaner control	Off

2. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
 - Official samples should be at least 900 grams.
 - Unofficial samples should be at least 750 grams.
3. Turn on the Carter dockage tester.
4. Pour the sample into the hopper.
5. After the sample has passed through the machine, turn on the sieve cleaner control for two to three seconds to remove kernels lodged in the sieve.
6. Turn off the dockage tester.
7. Lightly snap the retainer rod of the aspiration pan to loosen material gathered on the air screen.
8. Remove the aspiration pan.
9. Determine dockage, using the list under *Composition of dockage*.

Composition of dockage

Dockage includes

- Material handpicked or removed over the No. 6 riddle
- Lightweight material removed by aspiration
- Material that passes through the No. 4.5 round-hole sieve
- Material such as large seeds removed by the No. 5 buckwheat sieve in excess of the grade tolerance for total foreign material
- A maximum of 10% of soft earth pellets handpicked from the clean sample
- Material removed by *Cleaning for grade improvement*

Cleaning for grade improvement

If the grade of a sample can be improved by additional cleaning, perform the cleaning and add the additional material to dockage. Cleaning for grade improvement can be done at any time.

1. Sieve the sample, using the No. 6 buckwheat hand sieve.

▲ Important: When you use a hand sieve, move the sieve from left to right 30 times, using a sifting motion. One time is one complete motion from the centre, to one side, to the other side, and back to the centre. The total distance from left to right is 20 cm, or about eight inches.

2. Weigh the additional dockage and add it to the original dockage.

Cleaning for grade improvement

Material to be removed	Equipment	Effect on composition of dockage
Large seeds	No. 6 buckwheat hand sieve	Large seeds are seeds that pass through the No. 6 buckwheat sieve. Add them to dockage.
Stones	No. 6 buckwheat hand sieve	Add all stones that pass through the No. 6 buckwheat sieve to dockage.

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal or transfer elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported and elevator stocks will be adjusted on the basis of the analysis. Agreement of the shipper and unload elevator must be conveyed to the CGC in writing prior to the analysis being performed.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
 - The percentage by gross weight to the nearest 0.1% and the grade of mixed grain.
 - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
 - The percentage of dockage.

Example

95.0% Mixed Grain CW Wheat

4.0% Domestic Mustard Seed, No. 1 CAN Oriental

1.0% dockage

Grading

Important definitions

Net weight of sample	The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. For grading, percentages by weight refer to percentages of the net weight.
Kernel counts (K)	<p>A kernel count is the number of kernel-sized pieces in a 500 gram sample.</p> <ul style="list-style-type: none"> To do kernel counts, you must have 500 grams of cleaned sample. All grading is done on representative portions divided down from the cleaned sample using a Boerner-type divider.
Hazardous substances in samples	Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide or desiccant."

Representative portion for grading

All grading is done on representative portions divided down from the cleaned sample, using a Boerner-type divider.

When the concentration grading factor is . . .	Then use . . .
Low	optimum portion size
High	minimum portion size or more (do not use less)

Values in the table represent a range of recommended portion sizes.

Representative portion of mixed grain for grading, grams

Grading factor	Minimum	Optimum	Export
Broken	25	50	50
Ergot	500	1000	1000
Excreta	working sample	working sample	working sample
Fireburnt	500	working sample	working sample
Fusarium damage	25	100	100
Heated	25	100	100
Large seeds	100	250	working sample
Sclerotinia sclerotiorum	500	1000	1000
Soft earth pellets	working sample	working sample	working sample
Stones	500	1000	1000

Grading factors

Broken (BKN) Broken kernels are pieces of grain that are less than three-quarters of a whole kernel.

Representative portion for analysis

Minimum—25 g

Optimum—50 g

Export—50 g

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the “*Canada Grain Act*” as: “Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*.”

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Mixed Grain, Sample Condemned*.

Earth pellets (EP)

- Hard earth pellets are pellets that do not crumble under light pressure.
See *Stones*.
- Soft earth pellets are pellets that crumble under light pressure.
See *Soft earth pellets*.

Ergot (ERG)

Ergot is a plant disease producing elongated fungus bodies having a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.

Representative portion for analysis

Minimum—500 g

Optimum—1000 g

Export—1000 g

Procedures

- Determine the weight of ergot as a percentage of the net weight of the sample.

Excreta (EXCR)

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Representative portion for analysisMinimum—working
sampleOptimum—working
sampleExport—working
sample**Fertilizer pellets (FERT PLTS)**

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysisMinimum—working
sampleOptimum—working
sampleExport—working
sample**Procedures**

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Mixed Grain, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction “*Suspect Contaminated Grain, Handling Procedures*” for procedures to be followed when handling samples containing fertilizer pellets.

**Fireburnt
(FBNT)**

Fireburnt kernels are kernels charred or scorched by fire. A cross-section of a fireburnt kernel resembles charcoal with numerous air holes. The air holes result in a low weight kernel which crumbles easily under pressure.

Representative portion for analysis

Minimum—500 g

Optimum—working
sampleExport—working
sample**Heated
(HTD)**

Heated kernels are kernels having the colour and odour typical of grain that has heated in storage or has been damaged by artificial drying, but not charred kernels. Heated kernels include all heated grains in the sample.

Representative portion for analysis

Minimum—25 g

Optimum—100 g

Export—100 g

**Large seeds
(LSDS)**

Large seeds are seeds that do not pass through the No. 4.5 round-hole sieve and grains other than cereal grains, such as peas, beans, corn, flaxseed and domestic buckwheat. Large seeds remaining in the sample are included in *Total foreign material*.

Representative portion for analysis

Minimum—100 g

Optimum—250 g

Export—working
sample**Odour
(HTD)**

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

Representative portion for analysisMinimum—working
sampleOptimum—working
sampleExport—working
sample

If odour is the grade determinant and there is . . .	Then the grade is
A distinct objectionable odour not associated with the quality of the grain, but not heated or fireburnt	<i>Mixed grain, Sample CW/CE, Account Odour</i>
A distinct heated odour	<i>Mixed grain, Sample CW/CE, Account Heated</i>
A distinct fireburnt odour	<i>Mixed grain, Sample CW/CE, Account Fireburnt</i>

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, and have a dark black exterior, a pure white interior and a coarse surface texture.

Representative portion for analysis

Minimum—500 g

Optimum—1000 g

Export—1000 g

Soft earth pellets (SEP)

Soft earth pellets are

- Earth pellets that crumble into fine dust under light pressure using a finger only —if they do not crumble, they are considered *Stones*
- Any non-toxic material of similar consistency

Representative portion for analysisMinimum—working
sampleOptimum—working
sampleExport—working
sample**Procedures**

1. Handpick soft earth pellets from a representative portion of the cleaned sample.
2. Soft earth pellets constituting 10.0% or less of the sample are assessed as dockage.
3. Where soft earth pellets represent more than 10% of the net weight, the sample is graded *Mixed Grain, Sample CW/CE Account Admixture*.

**Stones
(STNS)**

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Representative portion for analysis

Minimum—500 g

Optimum—1000 g

Export—1000 g

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

Note: Stones may be removed and included in dockage if the the material removed is 5.0% or less of the gross weight of the sample. See *Cleaning for grade improvement*.

- In western Canada samples of grain containing stones in excess of “basic grade” tolerances, up to 2.5% are graded *Mixed Grain, Rejected “basic grade” Account Stones*. The “basic grade” refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Mixed Grain, Sample CE Account Stones*.
- In western and eastern Canada grain containing more than 2.5% stones is graded *Mixed Grain, Sample Salvage*.

Examples: Western Canada

Excerpt from grade determinant tables for
Mixed Grain, Canada Western (CW)

*Grade name	Stones
Mixed Grain CW Wheat	5K
Mixed Grain CW Rye	5K
Mixed Grain CW Barley	5K
Mixed Grain CW Oats	5K
Mixed Grain CW Triticale	5K
Mixed Grain CW	5K

* Defined in the *Canada Grain Regulations*

K Number of kernel-sized pieces in 500 g

Basic grade:*Mixed Grain, CW Wheat*

If the above sample contained	Grade in western Canada
10K stones	<i>Mixed Grain, Rejected CW Wheat Account Stones</i>
1.0% stones	<i>Mixed Grain, Rejected CW Wheat Account Stones</i>
3.0% stones	<i>Mixed Grain, Sample Salvage</i>

Examples: Eastern Canada

Excerpt from grade determinant tables for
Mixed Grain, Canada Eastern (CE)

*Grade name	Stones
Mixed Grain CE Wheat	5K
Mixed Grain CE Rye	5K
Mixed Grain CE Barley	5K
Mixed Grain CE Oats	5K
Mixed Grain CE Triticale	5K
Mixed Grain CE	5K

* Defined in the *Canada Grain Regulations*

K Number of kernel-sized pieces in 500 g

Basic grade:*Mixed Grain, CE Wheat*

If the above sample contained	Grade in eastern Canada
10K stones	<i>Mixed Grain, Sample CE Account Stones</i>
1.0% stones	<i>Mixed Grain, Sample CE Account Stones</i>
3.0% stones	<i>Mixed Grain, Sample Salvage</i>

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals—pink or red, canola—baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysisMinimum—working
sampleOptimum—working
sampleExport—working
sample

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Mixed grain, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction “*Suspected Contaminated Grain, Handling Procedures*” for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances

Primary grade determinants tables

Mixed Grain, Canada Western (CW)

*Grade name	**Composition
Mixed Grain CW Wheat	Mixtures of cereal grains and wild oats, wheat predominating
Mixed Grain CW Rye	Mixtures of cereal grains and wild oats, rye predominating
Mixed Grain CW Barley	Mixtures of cereal grains and wild oats, barley predominating
Mixed Grain CW Oats	Mixtures of cereal grains and wild oats, oats predominating
Mixed Grain CW Triticale	Mixtures of cereal grains and wild oats, triticale predominating
Mixed Grain CW	Mixtures of cereal grains and wild oats, no single grain predominating

*Grade name	Damage			Foreign material				
	Broken %	Fireburnt %	Heated %	Ergot %	Excreta %	Sclerotinia %	Stones	*Total %
Mixed Grain CW Wheat	20.0	0.5	10.0	0.10	0.02	0.25	5K	2.0
Mixed Grain CW Rye	20.0	0.5	10.0	0.10	0.02	0.25	5K	2.0
Mixed Grain CW Barley	20.0	0.5	10.0	0.10	0.02	0.25	5K	2.0
Mixed Grain CW Oats	20.0	0.5	10.0	0.10	0.02	0.25	5K	2.0
Mixed Grain CW Triticale	20.0	0.5	10.0	0.10	0.02	0.25	5K	2.0
Mixed Grain CW	20.0	0.5	10.0	0.10	0.02	0.25	5K	2.0
Grade, if specs for Mixed Grain not met	50% or less— Sample Feed Grain Over 50%— Sample Broken Grain	Mixed Grain, Sample CW Account Fireburnt	Mixed Grain, Sample CW Account Heated	Mixed Grain, Sample CW Account Ergot	Mixed Grain, Sample CW Account Excreta	Mixed Grain, Sample CW Account Sclerotinia Admixture	2.5% or less— Mixed Grain, Rejected (grade) Account Stones Over 2.5%— Mixed Grain, Sample Salvage	Mixed Grain, Sample CW Account Admixture

* Defined in the *Canada Grain Regulations* Schedule III Table XII

** All grades must have less than 50.0% by weight of wild oats

K Number of kernel-sized pieces in 500 grams

Mixed Grain, Canada Eastern (CE)

*Grade name		** *Composition				
Mixed Grain CW Wheat	Mixtures of cereal grains and wild oats, wheat predominating					
Mixed Grain CW Rye	Mixtures of cereal grains and wild oats, rye predominating					
Mixed Grain CW Barley	Mixtures of cereal grains and wild oats, barley predominating					
Mixed Grain CW Oats	Mixtures of cereal grains and wild oats, oats predominating					
Mixed Grain CW Triticale	Mixtures of cereal grains and wild oats, triticale predominating					
Mixed Grain CW	Mixtures of cereal grains and wild oats, with no single grain predominating					

Foreign material									
Damage									
*Grade name	Broken %	Fireburnt %	Heated %	Ergot %	Excreta %	Sclerotinia %	Stones	*Total %	
Mixed Grain CE Wheat	20.0	0.5	10.0	0.25	0.02	0.25	5K	2.0	
Mixed Grain CE Rye	20.0	0.5	10.0	0.25	0.02	0.25	5K	2.0	
Mixed Grain CE Barley	20.0	0.5	10.0	0.25	0.02	0.25	5K	2.0	
Mixed Grain CE Oats	20.0	0.5	10.0	0.25	0.02	0.25	5K	2.0	
Mixed Grain CE Triticale	20.0	0.5	10.0	0.25	0.02	0.25	5K	2.0	
Mixed Grain CE	20.0	0.5	10.0	0.25	0.02	0.25	5K	2.0	
Grade, if specs for Mixed grain not met	50% or less— Sample Feed Grain Over 50%— Sample Broken Grain	Mixed Grain, Sample CE Account Fireburnt	Mixed Grain, Sample CE Account Heated	Mixed Grain, Sample CE Account Ergot	Mixed Grain, Sample CE Account Excreta	Mixed Grain, Sample CE Account Admixture	2.5% or less— Mixed Grain, Sample CE Account Stones Over 2.5%— Mixed Grain, Sample Salvage	Mixed Grain, Sample CE Account Admixture	

* Defined in the Canada Grain Regulations Schedule III Table XLI

** All grades must have less than 50.0% by weight of wild oats

K Number of kernel-sized pieces in 500 grams

Export shipments

Shipments can be commercially clean or not commercially clean. Dockage is not reported for commercially clean shipments

Commercially clean

Shipments are defined as commercially clean when meeting the commercially clean specifications listed in the export grade determinant table upon following the *Determination of commercially clean* procedures described in this chapter.

No dockage is reported for samples representing commercially clean mixed grain.

Not commercially clean (NCC)

Shipments that do not meet the standards for commercial cleanliness are referred to as not commercially clean. Such shipments are allowed only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal and transfer elevators, dockage is reported to the nearest nearest 0.1%, less a direct deduction of up to 0.2%

Grading

Mixed grain on export is graded in accordance with export specifications. Where there is no export specification the primary specification and procedures are used. The composition of samples is shown on all records and endorsed on the backs of certificates.

Export grade determinants tables

Mixed Grain, Canada Western/Canada Eastern (CW/CE)

Grade name	Foreign material other than cereal grains and wild oats							Heated %
	Material through #4.5 round-hole sieve		Ergot %	Sclerotinia %	Stones	Total %		
	(1) Small seeds %	(2) Total %						
Mixed Grain CW/CE Wheat	0.1	0.2	0.10	0.25	5K	2.0	10.0	
Mixed Grain CW/CE Rye	0.1	0.2	0.10	0.25	5K	2.0	10.0	
Mixed Grain CW/CE Barley	0.1	0.2	0.10	0.25	5K	2.0	10.0	
Mixed Grain CW/CE Oats	0.1	0.2	0.10	0.25	5K	2.0	10.0	
Mixed Grain CW/CE Triticale	0.1	0.2	0.10	0.25	5K	2.0	10.0	
Mixed Grain CW/CE	0.1	0.2	0.10	0.25	5K	2.0	10.0	

K. Number of kernel-sized pieces in 500 grams

The area inside dashed lines refers to factors which are assessed in determining commercial cleanliness.

10. Canola and rapeseed

Classes and varieties	10-3
Canola	10-3
Rapeseed	10-3
Determination of dockage	10-4
Definitions	10-4
Dockage not reported	10-4
Normal cleaning procedures	10-4
Composition of dockage	10-6
Cleaning for grade improvement	10-6
Cleaning sample grade canola	10-7
Optional analysis	10-7
Grading	10-8
Important definitions	10-8
Net weight of sample	10-8
Hazardous substances in samples	10-8
Crush	10-8
Representative portion for grading	10-9
Grading factors	10-10
Broken	10-10
Colour	10-10
Conspicuous admixture	10-10
Contaminated grain	10-10
Damage	10-11
Distinctly green	10-11
Earth pellets	10-11
Ergot	10-11
Excreta	10-12
Fertilizer pellets	10-12
Fireburnt	10-12
Foreign material	10-12
Green	10-13
Heated	10-13
Inconspicuous admixture	10-13
Insect excreta	10-13
Odour	10-13
Rime	10-14
Sclerotinia sclerotiorum	10-14
Soft earth pellets	10-14
Staghead	10-15
Stones	10-15
Treated seed and other chemical substances	10-17

Primary grade determinants tables	10-18
Canola, Canada (CAN)	10-18
Rapeseed, Canada (CAN)	10-19
Export shipments	10-20
Commercially clean	10-20
Not commercially clean	10-20
Determination of dockage	10-21
Composition of dockage	10-21
Grading	10-21
Export grade determinants tables	10-22
Canola and rapeseed, Canada (CAN)	10-22

Classes and varieties

Canola and rapeseed are classes of the same botanical family.

This chapter describes dockage and grading procedures for canola and rapeseed. Canola has been used in the examples of grade names. If a sample of rapeseed is submitted for inspection, replace *Canola* with *Rapeseed*.

▲ **Important:** Ensure you use the correct grain code. Codes are different for canola and rapeseed.

Canola

The term canola applies to varieties that meet the canola standards for low levels of erucic acid and glucosinolates. Production of canola varieties is widespread.

Rapeseed

Rapeseed varieties are produced in small volumes, usually under contract. Shipments and submitted samples of rapeseed must be clearly identified as rapeseed.

▲ **Important:** Canola and rapeseed may be visually indistinguishable. However, their end uses are quite different. If you are not sure if the sample is canola or rapeseed, send the sample to the Chief Grain Inspector.

Determination of dockage

Definitions

Dockage is assessed and recorded to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as "any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain." Dockage is removed by following the cleaning procedures described in this section of the manual.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage is assessed in two stages.

1. Follow *Normal cleaning procedures*, using the Carter dockage tester.
2. Follow procedures for *Cleaning for grade improvement*. This cleaning can be done at any time after normal cleaning has been completed.

Dockage not reported

▲ **Important:** Dockage is not reported for samples grading

- *Canola, Sample Canada Account Fireburnt*
- *Canola, Sample Salvage*
- *Canola, Sample Condemned*

Normal cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any sample which you suspect may contain hazardous substances.

1. Set up the Carter dockage tester as follows:

Feed control	#3
Air control	#5
Riddle	No. 000
Top sieve	Blank tray
Centre sieve	None
Bottom sieve	None
Sieve cleaner	Off

2. You also need the following hand sieves:

Round-hole sieves	Slotted sieves
No. 5	No. .028
No. 5.5	No. .032
No. 6	No. .035
No. 6.5	No. .038
No. 7	No. .040
No. 7.5	

3. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.

- Official samples should be at least 900 g.
- Unofficial samples should be at least 750 g.

4. For hand sieving use approximately 250 g.

▲ **Important:**

- Ensure you start with the right sized sieves.
 - When you use a hand sieve, move the sieve from left to right 30 times, using a sifting motion. One time is one complete motion from the centre to one side, to the other side, and back to the centre. The total distance from left to right is 20 cm, or about eight inches.
1. Use whichever round-hole sieve will achieve maximum removal of large material with minimum loss of canola. Nest the round-hole sieve over the slotted sieve.
 2. Use whichever slotted sieve will reduce the admixture of conspicuous inseparable material to within the grade tolerance with a minimum loss of reasonably sound canola.
5. Combine the separated, cleaned 250-g portions.
6. Turn on the Carter dockage tester.
7. Run the entire working sample through the Carter dockage tester for aspiration only.
8. Using a Boerner-type divider, divide the sample to a portion of not less than 10 g.
9. Analyse the 10-g portion to determine the percentage by weight of inseparable foreign material.
10. Determine the dockage, using the list under *Composition of dockage*.

Composition of dockage

Dockage includes

- Material that remains on top of the round-hole sieve
- Material that passes through the slotted sieve
- Material removed by aspiration
- Material that passes over the No. 000 riddle
- Inseparable material, up to established grade tolerances, handpicked from the cleaned sample
 - In *Canola, Rejected (grade) Account Stones*, dockage includes inseparable material handpicked from the cleaned sample up to the tolerance for the grade of the sample.
 - In *Sample* grades, inseparable material is not included as dockage. When the weight of the inseparable admixture exceeds 2.0% of the net weight, the admixture becomes a second reason for the sample grade. This is recorded in Remarks.
- Soft earth pellets handpicked from the cleaned sample
- Material removed by *Cleaning for grade improvement*

Primary samples, commercially clean

Commercially clean primary samples can have up to 0.5% for broken and reasonably sound canola or rapeseed deducted from the gross weight of the dockage. For a definition of commercially clean, see *Export shipments*.

Primary samples, not commercially clean

In not commercially clean primary samples, there is no allowance for broken and reasonably sound canola or rapeseed. All the material removed by the slotted sieve is assessed as dockage.

Cleaning for grade improvement

If the grade of a delivery can be improved by additional cleaning, perform the cleaning and add the additional material to dockage. Cleaning for grade improvement can be done at any time after normal cleaning.

1. After normal cleaning, examine the material to be removed and select your equipment according to the material you want to remove. See the table *Cleaning for grade improvement—Canola* for the list of equipment.
2. Sieve the sample by hand or pass it through the Carter dockage tester, depending on the material.

▲ **Important:** When you use a hand sieve, move the sieve from left to right 30 times, using a sifting motion. One time is one complete motion from the centre, to one side, to the other side, and back to the centre. The total distance from left to right is 20 cm, or about eight inches.

3. Weigh the additional dockage and add it to the original dockage.

Cleaning for grade improvement—Canola

Material to be removed	Equipment	Effect on composition of dockage
Weed seeds	Carter dockage tester with air setting at #7, or approved sieves	Weed seeds are added to dockage. Not more than 5.0% of sound canola may be removed for each single grade improvement achieved.
Damaged seeds	Carter dockage tester with air setting at #7, or approved sieves	Weed seeds are added to dockage. Not more than 5.0% of sound canola may be removed for each single grade improvement achieved.

Cleaning sample grade canola

For canola that qualifies only for *Sample Canola, Account Admixture* after cleaning for grade improvement, dockage is assessed using the No. .035 slotted sieve, the round-hole sieve appropriate for the admixture, and the Carter dockage tester with air control set at #5.

For canola that qualifies only for *Sample Canola, Account Damaged* after cleaning for grade improvement, dockage is assessed using the appropriate round-hole and slotted sieves and the Carter dockage tester with air control set at #5. Use the slotted sieve appropriate for removing material consisting mainly of weed seeds and small broken grain. Also consider the maximum tolerance for inseparable admixture for these samples.

▲ Important: Variations from the above settings require authority from the Chief Grain Inspector.

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal or transfer elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported and elevator stocks will be adjusted on the basis of the analysis. Agreement of the shipper and unload elevator must be conveyed to the CGC in writing prior to the analysis being performed.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
 - The percentage by gross weight to the nearest 0.1% and the grade of canola.
 - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
 - The percentage of dockage.

Example

95.0% Canola, No. 1 CAN

4.0% Barley, No. 1 CW

1.0% dockage

Grading

Important definitions

Net weight of sample	The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the cleaned sample, or the net weight.
Hazardous substances in samples	Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide or desiccant."
Crush	A crush is one pass of the roller under firm pressure over a 100-seed stick on masking tape.

Representative portion for grading

All grading is done on representative portions divided down from the cleaned sample, using a Boemer-type divider.

When the concentration of the grading factor is ...	Then use ...
Low	Optimum portion size
High	Minimum portion size or more (do not use less)

Values in this table represent a range of recommended portions of samples for grading.

Representative portion of canola or rapeseed for grading, grams

Grading factor	Minimum	Optimum	Export
Conspicuous admixture	10	25	25
Damage	5	10	10
Distinctly green	5 crushes	10 crushes	10 crushes
Ergot	100	500	500
Excreta	working sample	working sample	working sample
Fireburnt	500	working sample	working sample
Heated	5 crushes	10 crushes	10 crushes
Inconspicuous admixture	1	5	5
Insect excreta	100	500	500
Odour	working sample	working sample	working sample
Rime	5	25	25
Sclerotinia sclerotiorum	100	500	500
Soft earth pellets	working sample	working sample	working sample
Staghead	10	25	25
Stones	100	working sample	working sample

Grading factors

Broken (BKN) Any broken canola that remains in the sample after cleaning and is otherwise sound is considered to be sound.

Colour (CLR) In assessing colour, consider

- The amount and degree of discolouration of the whole seed, such as from weathering
- The amount of rime (seeds densely and completely covered by rime are assessed as *Damage*)
- The proportion of crushed seeds which are only pale green or slightly immature and therefore not assessed as distinctly green

Note: Whole seeds that are green may be as a result of thin seed coats of certain canola varieties. Whole green seeds of these varieties are not indicators of elevated chlorophyll levels and therefore are not considered distinctly green or assessed as part of colour evaluation. Only seeds which are distinctly green throughout when crushed are assessed as distinctly green.

▲ **Important:** Where colour is the grade determinant, use the description under *Degree of soundness* in the *Primary grade determinants* table to assign the grade.

Conspicuous admixture (CADMX) Conspicuous admixture refers to seeds that remain in the sample after cleaning and are easily distinguished from canola without the use of magnification, including

- Domestic seeds such as flaxseed, yellow mustard, whole shrunken or broken kernels of other grains
- Weed seeds such as cow cockle, lamb's-quarters, cleavers, smartweed, ball mustard and pigweed.

Representative portion for analysis

Minimum—10 g

Optimum—25 g

Export—25 g

Contaminated grain ▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the "*Canada Grain Act*" as: "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Canola, Sample Condemned*.

Damage (DMG)	<p>Damage in canola includes seeds that are</p> <ul style="list-style-type: none"> • Distinctly shrunken or shrivelled • Badly discoloured from mould • Completely and densely covered with rime • Excessively weathered, sprouted, distinctly green, heated or otherwise damaged
-------------------------	---

Representative portion for analysis

Minimum—5 g

Optimum—10 g

Export—10 g

Number of crushes (100-seed strips) for analysis

Minimum—5

Optimum—10

Export—10

Procedures

1. Handpick the representative portion for visually damaged seeds.
2. Determine the percentage by weight.
3. Crush the appropriate number of strips from the portion remaining.
A crush is made with only one pass of the roller under firm pressure.
4. Convert the count of damaged seeds on the strip to percentage by weight. Add this percentage to the percentage of visually damaged seeds and crushed damaged seeds for *Total damage*.

Distinctly green (DGR)	Distinctly green tolerances are applied to crushed seeds which are a distinct green throughout. Pale green or immature seeds are taken into account in the evaluation of colour. See <i>Colour</i> .
---------------------------------------	--

Number of crushes (100-seed strips) for analysis

Minimum—5

Optimum—10

Export—10

ProceduresSee *Damage*.

Earth pellets (EP)	<ul style="list-style-type: none"> • Hard earth pellets are pellets that do not crumble under light pressure. See <i>Stones</i>. • Soft earth pellets are pellets that crumble under light pressure. See <i>Soft earth pellets</i>.
-------------------------------	---

Ergot (ERG)	Ergot is a plant disease producing elongated fungus bodies with a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.
------------------------	---

Representative portion for analysis

Minimum—100 g

Optimum—500 g

Export—500 g

**Excreta
(EXCR)**

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

There is a separate tolerance for insect excreta in canola.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

**Fertilizer
pellets
(FERT PLTS)**

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Canola, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

**Fireburnt
(FBNT)**

Samples that show any evidence of being charred or scorched by fire are considered fireburnt. Evidence includes odour, pieces of charred wood, and so on. Fireburnt seeds pop when crushed.

Representative portion for analysis

Minimum—500 g

Optimum—working
sample

Export—working
sample

Procedures

Samples considered fireburnt are graded *Canola, Sample Canada, Account Fireburnt*

**Foreign
material
(FM)**

Foreign material in canola includes anything that is not canola, such as stones, ergot, sclerotinia, conspicuous admixture and inconspicuous admixture.

Green See *Distinctly green*.

Heated (HTD) Heated refers only to seeds that are distinctly or badly binburnt. Heated seeds have a heated odour.

Crushed seeds may be

- Black—badly binburnt
- Dark chocolate brown—distinctly heated
- Light tan—slightly damaged from oxidation. If they have an odour or are present with brown or black crushed seeds, they are considered heated. Otherwise, they are included in *Total damage*, not heated.

Number of crushes (100-seed strips) for analysis

Minimum—5

Optimum—10

Export—10

Procedures

1. Examine 5 crushes for evidence of heating.
2. If no heated seeds detected, assess crushes for other damage. See *Damage*.
3. If at least 1 heated seed is detected, crush and assess an additional 5 crushes for heated seeds.

See *Damage*.

Inconspicuous admixture (INC ADMX) Inconspicuous admixture is defined as seeds of common wild mustard, domestic oriental mustard and domestic brown mustard that are not readily distinguishable from canola.

Representative portion for analysis

Minimum—1 g

Optimum—5 g

Export—5 g

Procedures

To determine the percentage by weight of inconspicuous admixture, analyse the sample with the aid of a microscope.

Insect excreta (I EXCR) ▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Representative portion for analysis

Minimum—100 g

Optimum—500 g

Export—500 g

Odour (ODOR) There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

Representative portion for analysisMinimum—working
sampleOptimum—working
sampleExport—working
sample

If odour is the grade determinant and there is . . .	Then the grade is . . .
A distinct objectionable odour not associated with the quality of the grain, but not heated or fireburnt	<i>Canola, Sample Canada, Account Odour</i>
A distinct heated odour	<i>Canola, Sample Canada, Account Heated</i>
A distinct fireburnt odour	<i>Canola, Sample Canada, Account Fireburnt</i>

Rime

Rime is the lining of the pod adhered to the seed. Seeds that are completely and densely covered with white rime are classed as damaged in any grade. Seeds with light rime sparsely covering the seed coat are

- Classed as sound if not otherwise damaged
- Considered in the evaluation of colour. See *Colour*

Representative portion for analysis

Minimum—5 g

Optimum—25 g

Export—25 g

ProceduresSee *Damage*.**Sclerotinia sclerotiorum (SCL)**

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, and have a dark black exterior, a pure white interior and a course surface texture.

Representative portion for analysis

Minimum—100 g

Optimum—500 g

Export—500 g

Soft earth pellets (SEP)

Soft earth pellets are

- Earth pellets that crumble into fine dust under light pressure, using a finger only—if they do not crumble, they are considered *Stones*
- Any non-toxic material of similar consistency

Representative portion for analysisMinimum—working
sampleOptimum—working
sampleExport—working
sample**Procedures**

1. Handpick soft earth pellets from a representative portion of the cleaned sample.
2. Soft earth pellets are removed as dockage. See *Composition of dockage*.

Staghead

Staghead or white rust is a fungal disease of canola. It affects the flowering parts of the plant, resulting in distorted antler-like structures that are often covered by white or grey powdery spores. For grading, staghead bodies are considered *Conspicuous admixture*.

Representative portion for analysis

Minimum—10 g

Optimum—25 g

Export—25 g

**Stones
(STNS)**

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Representative portion for analysis

Minimum—500 g

Optimum—1000 g

Export—1000 g

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
 2. Determine stone concentration in the net sample.
- In western Canada samples of grain containing stones in excess of “basic grade” tolerances, up to 2.5% are graded *Canola, Rejected “basic grade” Account Stones*. The “basic grade” refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
 - In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Canola, Sample Canada Account Stones*.
 - In western and eastern Canada grain containing more than 2.5% stones is graded *Canola, Sample Salvage*.

Examples: Western Canada

Excerpt from grade determinant tables for
Canola, Canada (CAN)

*Grade name	Stones %
No. 1 Canada	0.05
No. 2 Canada	0.05
No. 3 Canada	0.05

*Defined in the *Canada Grain Regulations*

Basic grade: *Canola, No. 2 Canada*

Reason for basic grade:4.0% Distinctly Green

If the above sample contained	Grade in western Canada
0.08% stones	<i>Canola, Rejected No. 2 Canada Account Stones</i>
3.0% stones	<i>Canola, Sample Salvage</i>

Examples: Eastern Canada

Excerpt from grade determinant tables for
Canola, Canada (CAN)

*Grade name	Stones %
No. 1 Canada	0.05
No. 2 Canada	0.05
No. 3 Canada	0.05

*Defined in the *Canada Grain Regulations*

Basic grade: *Canola, No. 2 Canada*

Reason for basic grade:4.0% Distinctly Green

If the above sample contained	Grade in eastern Canada
0.08% stones	<i>Canola, Sample Canada Account Stones</i>
3.0% stones	<i>Canola, Sample Salvage</i>

**Treated seed
and other
chemical
substances****Treated seed**

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals—pink or red, canola—baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Canola, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction “*Suspected Contaminated Grain, Handling Procedures*” for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances

Primary grade determinants tables

Canola, Canada (CAN)

*Grade name	Standard of quality		*Standard of cleanliness Commercially pure seed
	*Variety	*Degree of soundness	
No. 1 Canada	Any variety of canola equal to acceptable reference varieties	Reasonably well matured, sweet, good natural colour	Not more than 1.0% of other seeds that are conspicuous and that are not readily separable from canola, to be assessed as dockage
No. 2 Canada	Any variety of canola equal to acceptable reference varieties	Fairly well matured, sweet, reasonably good natural colour	Not more than 1.5% of other seeds that are conspicuous and that are not readily separable from canola, to be assessed as dockage
No. 3 Canada	Any variety of canola	May have the natural odour associated with low-quality seed, not distinctly sour, musty, rancid, or any odour that would indicate serious deterioration	Not more than 2.0% of other seeds that are conspicuous and that are not readily separable from canola, to be assessed as dockage
Grade, if No. 3 specs not met			Canola, Sample Canada Account Admixture

*Grade name	Damage			Foreign material						Inconspicuous admixture %
	*Distinctly green %	*Heated %	*Total %	Ergot %	Excreta %	Insect excreta %	Sclerotinia %	Stones %	Conspicuous admixture %	
No. 1 Canada	2.0	0.1	3.0	0.05	0.02	0.1	0.05	0.05	1.0	5.0
No. 2 Canada	6.0	0.5	10.0	0.05	0.02	0.2	0.10	0.05	1.5	5.0
No. 3 Canada	20.0	2.0	20.0	0.05	0.02	0.3	0.15	0.05	2.0	5.0
Grade, if No. 3 specs not met	Canola, Sample Canada Account Damaged	Canola, Sample Canada Account Heated	Canola, Sample Canada Account Damaged	Canola, Sample Canada Account Ergot	Canola, Sample Canada Account Excreta	Canola, Sample Canada Account Insect Excreta	Canola, Sample Canada Account Sclerotinia	2.5% or less—Canola, Rejected (grade) Account Stones, or Canola, Sample Canada Account Stones Over 2.5%—Canola, Sample Salvage	Canola, Sample Canada Account Admixture	50.0% or less—Canola, Sample Canada Account Admixture Over 50.0%—Refuse screenings

* Defined in the Canada Grain Regulations Schedule III Table XVI

Rapeseed, Canada (CAN)

*Grade name	Standard of quality			*Standard of cleanliness Commercially pure seed
	*Variety	*Degree of soundness		
No. 1 Canada	Any variety of rapeseed equal to acceptable reference varieties	Reasonably well matured, sweet, good natural colour		Not more than 1.0% of other seeds that are conspicuous and that are not readily separable from rapeseed, to be assessed as dockage
No. 2 Canada	Any variety of rapeseed equal to acceptable reference varieties	Fairly well matured, sweet, reasonably good natural colour		Not more than 1.5% of other seeds that are conspicuous and that are not readily separable from rapeseed, to be assessed as dockage
No. 3 Canada	Any variety of rapeseed	May have the natural odour associated with low-quality seed, not distinctly sour, musty, rancid, or any odour that would indicate serious deterioration		Not more than 2.0% of other seeds that are conspicuous and that are not readily separable from rapeseed, to be assessed as dockage
Grade, if No. 3 specs not met				Rapeseed, Sample Canada Account Admixture

*Grade name	Damage			Foreign material						Inconspicuous admixture %
	*Distinctly green %	*Heated %	*Total %	Ergot %	Excreta %	Insect excreta %	Sclerotinia %	Stones %	Conspicuous admixture %	
No. 1 Canada	2.0	0.1	3.0	0.05	0.02	0.1	0.05	0.05	1.0	5.0
No. 2 Canada	6.0	0.5	10.0	0.05	0.02	0.2	0.10	0.05	1.5	5.0
No. 3 Canada	20.0	2.0	20.0	0.05	0.02	0.3	0.15	0.05	2.0	5.0
Grade, if No. 3 specs not met	Rapeseed, Sample Canada Account Damaged	Rapeseed, Sample Canada Account Heated	Rapeseed, Sample Canada Account Damaged	Rapeseed, Sample Canada Account Ergot	Rapeseed, Sample Canada Account Excreta	Rapeseed, Sample Canada Account Excreta	Rapeseed, Sample Canada Account Admixture	2.5% or less—Rapeseed, Rejected (grade) Account Stones, or Rapeseed, Sample Canada Account Stones Over 2.5%—Rapeseed, Sample Salvage	Rapeseed, Sample Canada Account Admixture	50.0% or less—Rapeseed, Sample Canada Account Admixture Over 50.0%—Refuse screenings

* Defined in the Canada Grain Regulations Schedule III Table XXII

Export shipments

Export shipments can be commercially clean or not commercially clean.

Commercially clean

Shipments defined as commercially clean may contain material as follows.

Definition of commercial cleanliness, canola

Grade name	Material remaining on top of round-hole sieve, including coarse grains %		Total net dockage %
	Roughage material such as wild oats, seed pods, knuckles	Total	
No. 1 Canada	0.2	0.5	2.5
No. 2 Canada	0.2	0.5	2.5
No. 3 Canada	0.2	0.5	2.5

Dockage is reported to the nearest

- 0.1% for samples representing commercially clean shipments loaded from a single terminal or transfer elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal or transfer elevator

A deduction for broken and reasonably sound canola handpicked from the material and removed as dockage is allowed

- On shipments not for direct export, of up to 0.50%
- On shipments for direct export, of up to 0.75%

These deductions are applied to determine total net dockage for commercially clean shipments.

Not commercially clean (NCC)

Shipments that do not meet the standards for commercial cleanliness are referred to as *not commercially clean*. Such shipments are allowed only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal and transfer elevators, dockage is reported to the nearest 0.1%. Instead of the allowances for broken seed in commercially clean shipments, a direct deduction of up to 0.2% is applied to establish net dockage.

Determination of dockage

Follow procedures for normal cleaning, with the Carter dockage tester set up as follows:

Feed control	#3
Air control	#5
Riddle	No. 000
Top sieve	Blank tray
Centre sieve	None
Bottom sieve	None
Sieve cleaner	Off

You will also need the following hand sieves.

Round-hole sieves	Slotted sieves
No. 5	No. .028
No. 5.5	No. .032
No. 6	
No. 6.5	
No. 7	
No. 7.5	

Composition of dockage

In export grade canola, dockage consists of

- Material other than canola that passes over the No. 000 riddle or remains on top of the round-hole sieve
- Material that passes through the No. 028 or .032 slotted sieve, less the applicable allowance of broken and reasonably sound canola
- Material removed by aspiration
- *Conspicuous admixture* handpicked from the cleaned sample

Grading

Canola on export is graded in accordance with export specifications. Where there are no export specifications, the primary specifications are used.

Export grade determinants tables

Canola and rapeseed, Canada (CAN)

Grade name	Total removable material %	Damage			Foreign material					Inconspicuous admixture %
		Distinctly green %	Heated %	Total %	Ergot %	Insect excreta %	Sclerotinia %	Stones %	Conspicuous admixture %	
No. 1 Canada	2.5	2.0	0.1	3.0	0.05	0.1	0.05	0.05	1.0	5.0
No. 2 Canada	2.5	6.0	0.5	10.0	0.05	0.2	0.10	0.05	1.5	5.0
No. 3 Canada	2.5	20.0	2.0	20.0	0.05	0.3	0.15	0.05	2.0	5.0

11. Flaxseed and solin

Classes and varieties	11-3
Flaxseed	11-3
Solín	11-3
Determination of dockage	11-4
Definitions	11-4
Dockage not reported	11-4
Normal cleaning procedures	11-4
Composition of dockage	11-5
Cleaning for grade improvement	11-6
Optional analysis	11-7
Grading	11-8
Important definitions	11-8
Net weight of sample	11-8
Hazardous substances in samples	11-8
Representative portion for grading	11-8
Grading factors	11-9
Broken	11-9
Contaminated grain	11-9
Damage	11-9
Earth pellets	11-9
Ergot	11-9
Excreta	11-10
Fertilizer pellets	11-10
Fireburnt	11-10
Heated	11-10
Inseparable seeds	11-11
Odour	11-11
Other classes of flaxseed	11-11
Other oilseeds	11-12
Sclerotinia sclerotiorum	11-12
Soft earth pellets	11-12
Stones	11-12
Treated seed and other chemical substances	11-14
Primary grade determinants tables	11-16
Flaxseed, Canada Western/Canada Eastern (CW/CE)	11-16
Solín, Canada Western (CW)	11-17

11. Flaxseed and solin

Export shipments	11-18
Commercially clean	11-18
Not commercially clean	11-18
Determination of dockage	11-18
Composition of dockage	11-19
Grading	11-19
Export grade determinants	11-20
Flaxseed, Canada Western/Canada Eastern (CW/CE)	11-20
Solon, Canada Western (CW)	11-20

Classes and varieties

Flaxseed and solin are classes of the same botanical family.

This section describes dockage and grading procedures for flaxseed and solin. Flaxseed has been used in the examples of grade names, and throughout the section. All procedures and grading factors, however, apply to solin as well.

▲ **Important:** Ensure you use the correct grain code. Codes are different for flaxseed and solin.

Flaxseed

Flaxseed applies to varieties with brown seed coats. Golden flaxseed, has a yellow seed coat.

Solin

Solin refers to varieties with yellow seed coats and which meet solin standards for low linolenic acid content of less than 5%.

▲ **Important:** Golden flaxseed and solin may be visually indistinguishable. Their end uses, however, are very different and samples should be correctly identified. If you are not sure whether a sample is flaxseed or solin, send the sample to the Chief Grain Inspector.

Determination of dockage

Definitions

Dockage is assessed and recorded to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as “any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain.” Dockage is removed by the following cleaning procedures described in this chapter.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage is assessed in two stages.

1. Follow *Normal cleaning procedures*, using the Carter dockage tester.
2. Follow procedures for *Cleaning for grade improvement*. This cleaning can be done at any time after normal cleaning has been completed.

Dockage not reported

▲ **Important:** Dockage is not reported for samples graded

- *Flaxseed, Sample CW/CE Account Fireburnt*
- *Solin, Sample CW Account Fireburnt*
- *Flaxseed/Solin, Sample Salvage*
- *Flaxseed/Solin, Sample Condemned*

Normal cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

1. Set up the Carter dockage tester as follows:

Feed control	#4
Air control	#3
Riddle	No. 000
Top sieve	Blank tray
Centre sieve	None
Bottom sieve	None
Sieve cleaner control	Off

2. You need the No. 4.5 round-hole sieve, and one wire sieve, depending on the size of the flaxseed or solin and the nature of the material to be removed.

Round-hole sieves	Wire sieves
No. 4.5	No. 4x14 No. 3x16

3. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
- Official samples should be at least 900 g.
 - Unofficial samples should be at least 750 g.
4. For hand sieving use approximately 250 g
1. Nest the wire sieve over the No. 4.5 round-hole sieve.
 2. Shake each representative portion until maximum cleanout has been achieved through the wire sieve.
 3. Handpick seed clusters and return the seeds to the cleaned sample.
 4. Remove the wire sieve.
 5. Shake the sample until maximum cleanout has been achieved through the No. 4.5 round-hole sieve.
5. Combine the separated 250-g portions.
6. Turn on the Carter dockage tester.
7. Pour the entire working sample into the hopper.
8. After the sample has passed through the machine, turn off the machine.
9. Lightly snap the retainer rod of the aspiration pan to loosen material gathered on the air screen.
10. Using a Boerner-type divider, divide not less than 20 g from the cleaned working sample.
11. From the 20-g portion, determine the percentage by weight of inseparable foreign material.
12. Determine dockage, using the list under *Composition of dockage*.

Composition of dockage

Dockage includes

- Material remaining on top of the wire sieve, except flaxseed clusters and whole flaxseed that are put back into the sample
- Material that passes through the No. 4.5 round-hole sieve
- Material removed by aspiration
- Material that passes over the No. 000 riddle
- Soft earth pellets handpicked from the cleaned sample
- Inseparable material up to established grade tolerances handpicked from the clean sample
- Material removed by *Cleaning for grade improvement*

Primary samples, commercially clean

Commercially clean primary samples can have up to 0.5% for broken and reasonably sound flaxseed or solin deducted from the gross weight of the dockage. For a definition of commercially clean, see *Export shipments*.

Primary samples, not commercially clean

In not commercially clean primary samples there is no allowance for broken and reasonably sound flaxseed or solin.

Sample grades

In sample grades, inseparable admixture is not added to dockage. Where the inseparable admixture exceeds 2.0% of the sample by weight, the admixture becomes a reason for the sample grade and is recorded in remarks.

Rejected account stones

In samples that grade *Rejected (basic grade) Account Stones*, dockage includes inseparable admixture handpicked from the clean sample up to the tolerance.

**Cleaning
for grade
improvement**

If the grade of a delivery can be improved by additional cleaning, perform the cleaning and add the additional material to dockage. Cleaning for grade improvement can be done at any time after normal cleaning.

1. After normal cleaning, examine the material to be removed and select your equipment according to the material you want to remove. See the table *Cleaning for grade improvement—Flaxseed or solin* for the list of equipment.
2. Sieve the material by hand or pass it through the Carter dockage tester, depending on the material.

▲ **Important:** When you use a hand sieve, move the sieve from left to right 30 times, using a sifting motion. One time is one complete motion from the centre, to one side, to the other side, and back to the centre. The total distance from left to right is 20 cm, or about eight inches.

3. Weigh the additional dockage and add it to the original dockage.

Cleaning for grade improvement—Flaxseed or solin

Material to be removed	Equipment	Effect on composition of dockage
Inseparable material	No. 5 round-hole hand sieve	The material passing through the sieve is included in the dockage. Not more than 5.0% of sound flaxseed or solin may be removed for each single grade improvement achieved.
Lightweight material	Carter dockage tester, with Feed control at #4 and air control at #4.5	The material removed is included in the dockage. Not more than 5.0% of sound flaxseed or solin may be removed from the cleaned sample for each single grade improvement achieved.

**Optional
analysis**

Where a shipper requests special cleaning of a carlot of grain at a terminal or transfer elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported and elevator stocks will be adjusted on the basis of the analysis. Agreement of the shipper and unload elevator must be conveyed to the CGC in writing prior to the analysis being performed.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
 - The percentage by gross weight to the nearest 0.1% and the grade of flaxseed/solin.
 - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
 - The percentage of dockage.

Example

95.0% Flaxseed, No. 1 CW

4.0% Barley No. 1 CW

1.0% dockage

Grading

Important definitions

Net weight of sample	The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the cleaned sample, the net weight.
Hazardous substances in samples	Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide or desiccant."

Representative portion for grading

All grading is done on representative portions divided down from the cleaned sample, using a Boemer-type divider.

When the concentration of the grading factor is . . .	Then use . . .
Low	Optimum portion
High	Minimum portion or more (do not use less)

Values in this table represent a range of recommended portions of samples for grading.

Representative portion of flaxseed or solin for grading, grams

Grading factor	Minimum	Optimum	Export
Broken	25	100	100
Damage	10	50	50
Ergot	100	500	500
Excreta	working sample	working sample	working sample
Fireburnt	working sample	working sample	working sample
Heated	5	25	50
Inseparable seeds	20	50	50
Odour	working sample	working sample	working sample
Other classes	20	50	50
Sclerotinia sclerotiorum	100	500	500
Soft earth pellets	working sample	working sample	working sample
Stones	100	working sample	working sample

Grading factors

**Broken
(BKN)**

Broken seeds are pieces of flaxseed or solin that are less than three-quarters the size of a whole seed.

▲ Important:

- Flaxseed and solin have separate tolerances for *Broken*.
- Broken seeds of flaxseed and solin are also included in *Total damage*.

Representative portion for analysis

Minimum—25 g

Optimum—100 g

Export—100 g

**Contaminated
grain**

▲ Important: Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the “*Canada Grain Act*” as: “Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*.”

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Flaxseed, Sample Condemned*.

**Damage
(DMG)**

Damage includes

- Seeds that are heated, broken, frosted, green, sprouted, shriveled, underdeveloped or severely discoloured
- Seeds with fractured seed coats

▲ Important: Seeds are not considered damaged if they

- Have any side portions of the boll membrane attached but are otherwise sound
- Appear scabbed or blistered but are otherwise sound

Representative portion for analysis

Minimum—10 g

Optimum—50 g

Export—50 g

**Earth pellets
(EP)**

- Hard earth pellets are pellets that do not crumble under light pressure.
See *Stones*.
- Soft earth pellets are pellets that crumble under light pressure.
See *Soft earth pellets*.

**Ergot
(ERG)**

Ergot is a plant disease producing elongated fungus bodies with a purplish-black exterior, a purplish-white to off-white interior, and a relatively smooth surface texture.

Representative portion for analysis

Minimum—100 g

Optimum—500 g

Export—500 g

**Excreta
(EXCR)**

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Representative portion for analysisMinimum—working
sampleOptimum—working
sampleExport—working
sample**Fertilizer
pellets
(FERT PLTS)**

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysisMinimum—working
sampleOptimum—working
sampleExport—working
sample**Procedures**

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Flaxseed, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

**Fireburnt
(FBNT)**

Samples that show any evidence of being charred or scorched by fire are considered fireburnt. Evidence includes odour, pieces of charred wood, and so on. Fireburnt seeds pop when crushed.

Representative portion for analysisMinimum—working
sampleOptimum—working
sampleExport—working
sample**Procedures**

Samples considered fireburnt are graded *Flaxseed, Sample CW/CE, Account Fireburnt*.

**Heated
(HTD)**

The seed coats of heated seeds are usually shiny brown or black.

When the seed is cut, the cotyledons of heated seeds are discoloured. The discolouration ranges from dark tan, orange or dark brown, depending on the severity of heat damage.

Severely heated seeds often have a heated odour.

Representative portion for analysis

Minimum—5 g

Optimum—25 g

Export—50 g

Procedures

To determine the percentage by weight of heated seeds in a sample, examine a representative portion of not less than 5 g of the cleaned sample.

Inseparable seeds (INSEP SDS)

Inseparable seeds are domestic seeds such as mustard seed, canola, whole shrunken or broken kernels of other grains and weed seeds such as wild oats and lady's thumb that remain in the sample after cleaning.

Representative portion for analysis

Minimum—20 g

Optimum—50 g

Export—50 g

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

If odour is the grade determinant and there is ...	Then the grade is ...
A distinct objectionable odour not associated with the quality of the grain, but not heated or fireburnt	<i>Flaxseed, Sample CWICE Account Odour</i>
A distinct heated odour	<i>Flaxseed, Sample CWICE Account Heated</i>
A distinct fireburnt odour	<i>Flaxseed, Sample CWICE Account Fireburnt</i>

Other classes of flaxseed (OCL)

- In solin, other classes of flaxseed refers to classes of brown and golden flaxseed with high linolenic acid content
- In flaxseed, other classes of flaxseed refers to classes with yellow or golden seed coats.

▲ **Important:** Golden flaxseed and solin may be visually indistinguishable. However, their end uses are quite different. If you are not sure if the sample is golden flaxseed or solin, send the sample to the Chief Grain Inspector.

Representative portion for analysis

Minimum—20 g

Optimum—50 g

Export—50 g

Other oilseeds

Other oilseeds applies to solin only.

In solin, other oilseeds is part of the tolerance for *Other oilseeds and inseparable seeds*.

Representative portion for analysis

Minimum—20 g

Optimum—50 g

Export—50 g

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape and have a dark black exterior, a pure white interior and a coarse surface texture.

Representative portion for analysis

Minimum—100 g

Optimum—500 g

Export—500 g

Soft earth pellets (SEP)

Soft earth pellets are

- Earth pellets that crumble into fine dust under light pressure, using a finger only—if they do not crumble, they are considered *Stones*
- Any non-toxic material of similar consistency

Representative portion for analysis

Minimum—working sample

Optimum—working sample

Export—working sample

Procedures

1. Handpick soft earth pellets from a representative portion of the cleaned sample.
2. Soft earth pellets are removed as dockage. See *Composition of dockage*.

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Representative portion for analysis

Minimum—500 g

Optimum—1000 g

Export—1000 g

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
 2. Determine stone concentration in the net sample.
- In western Canada samples of grain containing stones in excess of “basic grade” tolerances, up to 2.5% are graded *Flaxseed, Rejected “basic grade” Account Stones*. The “basic grade” refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.

- In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Flaxseed, Sample Canada Eastern Account Stones*.
- In western and eastern Canada grain containing more than 2.5% stones is graded *Flaxseed, Sample Salvage*.

Examples: Western Canada

Excerpt from grade determinant tables for
Flaxseed, CW/CE

*Grade name	Stones %
No. 1 CW	0.05
No. 2 CW	0.05
No. 3 CW	0.05

*Defined in the *Canada Grain Regulations*

Basic grade:*Flaxseed, No. 1 CW*

If the above sample contained	Grade in Western Canada
0.08% stones	<i>Flaxseed, Rejected No. 1 CW Account Stones</i>
3.0% stones	<i>Flaxseed, Sample Salvage</i>

Examples: Eastern Canada

Excerpt from grade determinant tables for
Flaxseed, CW/CE

*Grade name	Stones %
No. 1 CE	0.05
No. 2 CE	0.05
No. 3 CE	0.05

*Defined in the *Canada Grain Regulations*

Basic grade: *Flaxseed, No. 1 CE*

If the above sample contained	Grade in Eastern Canada
0.08% stones	<i>Flaxseed, Sample CE Account Stones</i>
3.0% stones	<i>Flaxseed, Sample Salvage</i>

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals—pink or red, canola—baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Flaxseed, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspected Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances

Primary grade determinants tables

Flaxseed, Canada Western/Canada Eastern (CW/CE)

*Grade name	Standard of quality			*Standard of cleanliness Commercially pure seed %
	*Minimum test weight kg/hL (g/0.5L)	*Variety	*Degree of soundness	
No. 1 CW/CE	65.0 (305)	Any variety of flaxseed equal to acceptable reference varieties	Mature and sweet	Not more than 1.0% of other seeds that are not readily separable from flaxseed, to be assessed as dockage
No. 2 CW/CE	62.0 (290)	Any variety of flaxseed equal to acceptable reference varieties	Reasonably well matured and sweet	Not more than 1.5% of other seeds that are not readily separable from flaxseed, to be assessed as dockage
No. 3 CW/CE	—	Any variety of flaxseed	Excluded from higher grades on account of light weight or damaged seeds, may have the natural odour associated with low-quality seed, not distinctly sour, musty, rancid or any odour that would indicate serious deterioration	Not more than 2.0% of other seeds that are not readily separable from flaxseed, to be assessed as dockage

*Grade name	Yellow seeded flaxseed and solin— CW only %	Damage				Foreign material included in dockage					
		Broken %	*Heated %		*Total %	Ergot %	Excreta %	Sclerotinia %	Stones %	Inseparable seeds %	Total %
			CW	CE							
No. 1 CW/CE	2.0	12.5	0.05	0.2	12.5	0.05	0.02	0.1	0.05	1.0	1.0
No. 2 CW/CE	3.0	25.0	0.2	0.5	25.0	0.05	0.02	0.2	0.05	1.5	1.5
No. 3 CW/CE	4.0	35.0	10.0	10.0	—	0.05	0.02	0.25	0.05	2.0	2.0
Grade, if No. 3 specs not met	50.0% or less— Flaxseed, Sample CW Account Admixture 50.0% or over— use Solin specs	50.0% or less— Flaxseed, Sample CW/CE Account Broken Over 50.0% — Sample Broken Grain	Flaxseed, Sample CW/CE Account Heated			Flaxseed, Sample CW/ CE Account Ergot	Flaxseed, Sample CW/ CE Account Excreta	Flaxseed, Sample CW/ CE Account Admixture	25% or less—Flaxseed, Rejected (grade) Account Stones or Flaxseed, Sample CE Account Stones Over 2.5%—Flaxseed, Sample Salvage	Flaxseed, Sample CW/CE Account Admixture	Flaxseed, Sample CW/CE Account Admixture

* Defined in the Canada Grain Regulations Schedule III Table XI and XI.

Solin, Canada Western (CW)

*Grade name	Standard of quality			Damage		
	*Minimum test weight kg/hL (g/0.5L)	*Variety	*Degree of soundness	Broken %	*Heated %	*Total %
No. 1 CW	65.0 (311)	Any variety of solin equal to acceptable reference varieties	Mature and sweet, good natural colour	5.0	0.05	5.0
No. 2 CW	62.0 (296)	Any variety of solin equal to acceptable reference varieties	Reasonably well matured and sweet, reasonably good natural colour	10.0	0.2	10.0
No. 3 CW	-	Any variety of solin equal to acceptable reference varieties	Excluded from higher grades on account of light weight or damaged seeds, may have the natural odour associated with low-quality seed but not distinctly sour, musty, rancid or having any odour that would indicate serious deterioration	20.0	1.0	20.0
Grade, if No. 3 specs not met				50% or less—Soln, Sample CW Account Broken Over 50%—Sample, Broken Grain	Solin, Sample CW Account Heated	Solin, Sample CW Account Damage

*Grade name	Foreign material included in dockage					
	Other classes %	Ergot %	Excreta %	Other oilseeds and inseparable seeds %	Sclerotinia %	Stones %
No. 1 CW	1.0	0.05	0.02	1.0	0.1	0.05
No. 2 CW	1.5	0.05	0.02	1.5	0.2	0.05
No. 3 CW	2.0	0.05	0.02	2.0	0.25	0.05
Grade, if No. 3 specs not met	50.0% or less—Soln, Sample CW Account Admixture Over 50.0% —use flaxseed specs	Solin, Sample CW Account Ergot	Solin, Sample CW Account Excreta	Solin, Sample CW Account Admixture	Solin, Sample CW Account Admixture	2.5% or less—Soln, Rejected (grade) Account Stones Over 2.5%—Soln, Sample Salvage
						Solin, Sample CW Account Admixture
						Total %
						1.0
						1.5
						2.0

* Defined in the Canada Grain Regulations Schedule III Table XI.1

Export shipments

Export shipments can be commercially clean or not commercially clean.

Commercially clean

Shipments are defined as commercially clean when the net dockage does not exceed 2.5% of the sample weight.

Dockage is reported to the nearest

- 0.1% for samples representing commercially clean shipments loaded from a single terminal or transfer elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal or transfer elevator

A deduction for broken and reasonably sound flaxseed handpicked from the material and removed as dockage is allowed

- On shipments not for direct export, of up to 0.50%
- On shipments for direct export, of up to 0.75%

Not commercially clean (NCC)

Shipments that do not meet the standards for commercial cleanliness are referred to as *not commercially clean*. Such shipments are allowed only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal and transfer elevators, dockage is reported to the nearest 0.1%. Instead of the allowances for broken seed in commercially clean shipments, a direct deduction of up to 0.2% is applied to establish net dockage.

Determination of dockage

Follow procedures for normal cleaning, with the Carter dockage tester set up as follows.

Feed control	#3
Air control	#2
Riddle	None
Top sieve	Blank tray
Centre sieve	None
Bottom sieve	None
Sieve cleaner	Off

You will also need the following hand sieves.

Round-hole sieves	Wire sieves
No. 4.5	No. 4x14 No. 3x16

**Composition
of dockage**

In export grade flaxseed and solin, dockage consists of

- Material that remains on top of the wire sieve
- Material that passes through the No. 4.5 round-hole hand sieve, less the applicable allowance of broken and reasonably sound flaxseed
- Material removed by aspiration
- Inseparable material up to established grade tolerances, handpicked from the cleaned sample

Grading

Flaxseed and solin on export are graded in accordance with export specifications. Where there are no export specifications the primary specifications are used.

Export grade determinants tables

Flaxseed, Canada Western/Canada Eastern (CW/CE)

Grade name	Total removable material %	Foreign material included in dockage				Yellow seeded flaxseed and solin—CW only %	Damage		
		Ergot %	Sclerotinia %	Stones %	Total including inseparable seeds %		Broken %	Heated %	Total %
No. 1 CW/CE	2.5	0.05	0.10	0.05	1.0	2.0	12.5	0.05	12.5
No. 2 CW/CE	2.5	0.05	0.20	0.05	1.5	3.0	25.0	0.2	25.0
No. 3 CW/CE	2.5	0.05	0.25	0.05	2.0	4.0	35.0	10.0	No limit within broken and heated tolerances

Solin, Canada Western (CW)

Grade name	Total removable material %	Foreign material included in dockage					Damage		
		Ergot %	Other inseparable seeds %	Sclerotinia %	Stones %	Total %	Other classes of flaxseed %	Broken %	Heated %
No. 1 CW	2.5	0.05	1.0	0.10	0.05	1.0	1.0	5.0	0.05
No. 2 CW	2.5	0.05	1.5	0.20	0.05	1.5	1.5	10.0	0.2
No. 3 CW	2.5	0.05	2.0	0.25	0.05	2.0	2.0	20.0	10.0

12. Domestic mustard seed

Classes	12-4
Determination of dockage	12-5
Definitions	12-5
Dockage not reported	12-5
Normal cleaning procedures	12-5
Composition of dockage	12-7
Cleaning for grade improvement	12-7
Optional analysis	12-8
Grading definitions	12-9
Important definitions	12-9
Net weight of sample	12-9
Kernel counts	12-9
Hazardous substances in samples	12-9
Crush	12-9
Representative portion for grading	12-9
Grading—brown domestic mustard seed	12-10
Representative portion of brown mustard seed for grading	12-10
Grading factors	12-11
Canola	12-11
Classes	12-11
Cockle	12-11
Colour	12-11
Conspicuous admixture	12-12
Contaminated grain	12-12
Damage	12-12
Distinctly detrimental	12-13
Earth pellets	12-13
Ergot	12-13
Excreta	12-13
Fertilizer pellets	12-14
Fireburnt kernels	12-14
Frost	12-14
Green	12-14
Heated kernels	12-15
Inconspicuous admixture	12-15
Mixed classes	12-15
Odour	12-15
Other classes	12-16
Rime	12-16
Sclerotinia sclerotiorum	12-16
Soft earth pellets	12-16
Stones	12-17
Treated seed and other chemical substances	12-19

12. Domestic mustard seed

Variety	12-20
Wild mustard	12-20
Primary and export grade determinants tables	12-21
Domestic Mustard Seed, Brown, Canada (CAN)	12-21
Grading—oriental domestic mustard seed	12-22
Representative portion of oriental domestic mustard seed for grading	12-22
Grading factors	12-23
Blotched seeds	12-23
Canola	12-23
Classes	12-23
Cockle	12-23
Colour	12-23
Conspicuous admixture	12-24
Contaminated grain	12-24
Damage	12-24
Distinctly detrimental	12-25
Distinctly green	12-25
Earth pellets	12-25
Ergot	12-25
Excreta	12-25
Fertilizer pellets	12-26
Fireburnt kernels	12-26
Frost	12-26
Green	12-26
Heated kernels	12-27
Inconspicuous admixture	12-27
Mixed classes	12-27
Odour	12-27
Other classes	12-28
Rime	12-28
Sclerotinia sclerotiorum	12-28
Soft earth pellets	12-29
Stones	12-29
Treated seed and other chemical substances	12-31
Variety	12-32
Wild mustard	12-32
Primary and export grade determinants tables	12-33
Domestic Mustard Seed, Oriental, Canada (CAN)	12-33
Grading—yellow domestic mustard seed	12-34
Representative portion of oriental domestic mustard seed for grading	12-34
Grading factors	12-35
Canola	12-35
Classes	12-35
Cockle	12-35
Colour	12-35

Conspicuous admixture	12-35
Contaminated grain	12-36
Damage	12-36
Distinctly detrimental	12-37
Distinctly green	12-37
Earth pellets	12-37
Ergot	12-37
Excreta	12-37
Fertilizer pellets	12-38
Fireburnt kernels	12-38
Frost	12-39
Green	12-39
Heated kernels	12-39
Mixed classes	12-39
Odour	12-39
Other classes	12-40
Other distinctly detrimental	12-40
Rime	12-40
Sclerotinia sclerotiorum	12-41
Soft earth pellets	12-41
Stones	12-41
Treated seed and other chemical substances	12-43
Variety	12-44
Wild mustard	12-44
Primary and export grade determinants tables	12-45
Domestic Mustard Seed, Yellow, Canada (CAN)	12-45
Export shipments	12-46
Commercially clean	12-46
Not commercially clean	12-46
Determination of dockage	12-46
Composition of dockage	12-47
Grading	12-47

Classes

Domestic mustard seed is classed as yellow, brown or oriental, or mixed. The class forms part of the grade name; for example, *Domestic Mustard Seed, Sample Canada Yellow Account Heated*.

Identifying classes of domestic mustard seed

Class	Colour	Size	Shape	Surface
Yellow	Light creamy-yellow to yellow Occasional seed is light or yellowish brown	Large, 2 to 3 mm in diameter	Oval or spherical	Textured, similar to an orange peel, hilum—small white spot on a deep yellow to light tan circular area
Brown	Reddish-brown to dark-brown	Small, less than 2 mm in diameter	Oval or spherical	Predominant netting, hilum—white on a black or darker brown circular area
Oriental	Predominantly yellow to dark-yellow, with some seeds ranging from light brown to brown	Small, less than 2 mm in diameter	Oval	Fine netting, not as predominant as netting on brown mustard, hilum—white on a darker yellow to lighter brown circular area
Mixed	Yellow and brown mustard seed containing less than 90.0% of one class See also <i>Domestic mustard seed, oriental: Other classes</i>			

Determination of dockage

Definitions

Dockage is assessed and recorded to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as "any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain." Dockage is removed by following the cleaning procedures described in this chapter.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage is assessed in two stages.

1. Follow *Normal cleaning procedures*, using the Carter dockage tester.
2. Follow procedures for *Cleaning for grade improvement*. This cleaning can be done at any time after normal cleaning has been completed.

Dockage not reported

▲ **Important:** Dockage is not reported for samples grading

- *Domestic Mustard Seed, Sample Canada (class) Account Fireburnt*
- *Domestic Mustard Seed, Sample Salvage*
- *Domestic Mustard Seed, Sample Condemned*

Normal cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

1. Set up the Carter dockage tester as follows:

Feed control	#3
Air control	#7
Riddle	No. 000
Top sieve	Blank tray
Centre sieve	none
Bottom sieve	none
Sieve cleaner control	off

2. You also need the following hand sieves:

Round-hole hand sieves	Slotted hand sieves
No. 5.5	No. .028
No. 6	No. .032
No. 6.5	No. .035
No. 7	No. .038
No. 7.5	No. .040

3. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.

- Official samples should be at least 900 g.
- Unofficial samples should be at least 750 g.

4. For hand sieving use approximately 250 g.

▲ **Important:**

- Ensure you start with the right sized sieves.
- When you use a hand sieve, move the sieve from left to right 30 times, using a sifting motion. One time is one complete motion from the centre to one side, to the other side, to the other side, and back to the centre. The total distance from left to right is 20 cm, or about eight inches.

1. Use whichever round-hole sieve will achieve maximum removal of large material with minimum loss of domestic mustard seed.
Nest the round-hole sieve over the slotted sieve.
2. Use whichever slotted sieve will achieve maximum removal of weed seeds with minimum loss of domestic mustard seed.

5. Combine the separated, cleaned 250-g portions.
6. Turn on the Carter dockage tester.
7. Pour the sample into the hopper.
8. After the sample has passed through the machine, turn off the machine.
 - Reduce the air setting to #5 if there is a large loss of whole, reasonably sound seed.
 - If the sample after normal cleaning with air control at #7 qualifies only for *Sample* grade, you must start all over again. Recombine the sample and whatever material has been removed, and re-assess dockage with the air control at #5.
9. Determine dockage, using the list under *Composition of dockage*.

Composition of dockage

Dockage includes

- Material remaining on top of the round-hole hand sieve
- Material passing through the slotted hand sieve
- Material passing over the No. 000 riddle
- Material removed by aspiration
- Material removed by *Cleaning for grade improvement*

Cleaning for grade improvement

If the grade of a delivery can be improved by additional cleaning, perform the cleaning and add the additional material to dockage. Cleaning for grade improvement can be done at any time after normal cleaning.

Carter dockage tester

1. After normal cleaning, examine the material to be removed and select your equipment according to the material you want to remove. See the table *Cleaning for grade improvement—domestic mustard seed*.
2. Pass the sample through the Carter dockage tester.
3. Weigh the additional dockage and add it to the original dockage.

Spiral cleaner— for yellow mustard seed and only upon request

1. Pour the entire net sample after cleaning into the feed hopper at the top of the spiral cleaner
2. Once the sample has passed through the spiral cleaner, lightly tap the cleaner to remove any lodged seeds remaining in the flights
3. Collect and determine the percentage of seeds that have discharged from the bottom spout (spout closest to the core of the cleaner)

Cleaning for grade improvement—domestic mustard seed

Material to be removed	Equipment		Effect on composition of dockage
Excessive inseparable weed seeds or damaged mustard seeds for all classes of mustard seed	Spiral cleaner—on request, for yellow mustard seed only		Not more than about 5.0% of domestic mustard seed may be removed for each grade improvement achieved.
	Carter dockage tester set as follows:		
	Feed control	#3	
	Air control	#7	
	Riddle	No. 000	
	Top sieve	No. 4.5 or No. 5 round-hole	
	Centre sieve	blank tray	
	Bottom sieve	none	
	Sieve cleaner control	off	
Canola or wild mustard in yellow mustard seed	Carter dockage tester set as follows:		The material passing through the sieve is included in the dockage.
	Feed control	#3	
	Air control	off	Not more than 5.0% of sound domestic mustard seed may be removed for each grade improvement achieved.
	Riddle	No. 000	
	Top sieve	none	
	Centre sieve	No. 4.5 or No. 5 round-hole	
	Bottom sieve	blank tray	
	Sieve cleaner control	off	

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal or transfer elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported and elevator stocks will be adjusted on the basis of the analysis. Agreement of the shipper and unload elevator must be conveyed to the CGC in writing prior to the analysis being performed.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
 - The percentage by gross weight to the nearest 0.1% and the grade of mustard.
 - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
 - The percentage of dockage.

Example

95.0% Domestic Mustard Seed, No. 1 CAN Yellow

4.0% Rye, No. 2 CW

1.0% dockage

Grading

Important definitions

Net weight of sample	The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. For grading, percentages by weight refer to percentages of the net weight.
Kernel counts (K)	A kernel count is the number of kernel-sized pieces in a 500 g sample.
Hazardous substances in samples	Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide or desiccant."
Crush	A crush is one pass of the roller under firm pressure over a 100-seed stick on masking tape.

Representative portion for grading

All grading is done on representative portions divided down from the cleaned sample, using a Boerner-type divider.

When the concentration of the grading factor is . . .	Then use . . .
Low	Optimum portion size
High	Minimum portion size or more (do not use less)

Values in the table on the next page represent a range of recommended portions of samples for grading.

Grading—brown domestic mustard seed

Representative portion of brown domestic mustard seed for grading, grams

Grading factor	Minimum	Optimum	Export
Canola	5	25	5-25
Cockle	5	50	5-50
Colour	working sample	working sample	working sample
Conspicuous admixtures	5	50	5-50
Damage	5	10	10
Distinctly detrimental	5	50	5-50
Distinctly green	5 crushes	10 crushes	10 crushes
Ergot	100	500	500
Excreta	working sample	working sample	working sample
Fertilizer pellets	1000	1000	1000
Fireburnt	working sample	working sample	working sample
Heated	5 crushes	10 crushes	10 crushes
Inconspicuous admixture	5	25	5-25
Odour	working sample	working sample	working sample
Other classes	2	5	2-5
Rime	5	10	10
Sclerotinia sclerotiorum	100	500	500
Soft earth pellets	100	working sample	working sample
Stones	100	working sample	working sample
Wild mustard seed	5	25	5-25

Grading factors

**Canola
(CNL)**

In brown mustard, canola is classed as *Inconspicuous admixture*.

▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analyses are confirmed by seed analysts.

Representative portion for analysis

Minimum—5 g

Optimum—25 g

Export—5-25 g

Classes

Domestic mustard seed is classed as yellow, brown or oriental, or mixed. The class forms part of the grade name; for example, *Domestic Mustard Seed, Sample Canada Brown, Account Heated*. For a description of classes, see *Identifying classes of domestic mustard seed*.

**Cockle
(COC)**

Cockle, or cow cockle, is a hard roundish seed with a dull surface covered with numerous small bumps giving the seed a rough spiky appearance. Colour can be deep black, bluish-black or orangish-brown. In brown mustard, cockle is part of *Conspicuous admixture*.

Representative portion for analysis

Minimum—5 g

Optimum—50 g

Export—5-50 g

Procedures

Use a microscope to examine the sample.

**Colour
(CLR)**

In analysing colour, consider

- The general degree of maturity
- The amount and degree of discolouration, such as from weathering
- The proportion of damaged seeds, which are distinctly green or otherwise colour-damaged. See *Damage* and *Distinctly green*.
- The amount of rime—light rime is considered in the overall appearance of the sample. See *Damage*.

Representative portion for analysisMinimum—working
sampleOptimum—working
sampleExport—working
sample

Conspicuous admixture (CADMX)

Conspicuous admixture is also called *Conspicuous inseparable seeds* in the grade determinants tables. In brown mustard, conspicuous admixture includes

- Small seeds or broken seeds of other grains
- Weed seeds such as cow cockle, lamb's-quarters, ball mustard, pigweed, cleavers, smartweed and lady's thumb.
- Any conspicuous foreign material except stones and soft earth pellets

Representative portion for analysis

Minimum—5 g

Optimum—50 g

Export—5-50 g

▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analyses are confirmed by seed analysts.

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the "Canada Grain Act" as: "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Domestic Mustard Seed, Sample Canada Brown Condemned*.

Damage (DMG)

Damaged seeds include those that are

- Distinctly shrunken or shrivelled
- Badly discoloured from mould
- Completely and densely covered with rime
- Excessively weathered, sprouted, distinctly green, heated or otherwise damaged

Representative portion for analysis

Minimum—5 g

Optimum—10 g

Export—10 g

Number of crushes (100-seed strips) for analysis

Minimum—5

Optimum—10

Export—10

Procedures

1. Handpick the representative portion to determine the content of visually damaged seeds.
2. Determine the percentage by weight.
3. Crush the appropriate number of strips from the portion remaining.
A crush is made with only one pass of the roller under firm pressure.
4. Convert the count of damaged seeds on the strip to percentage by weight. Add the percentage of visually damaged seeds and crushed seeds for *Total damage*.

Distinctly detrimental (DDET)	Admixtures considered distinctly detrimental include <ul style="list-style-type: none"> • Cow cockle • Sclerotinia
	Representative portion for analysis Minimum—5 g Optimum—50 g Export—5-50 g
Distinctly green (DGR)	Distinctly green tolerances are applied to crushed seeds which are a distinct green throughout. Pale green or immature seeds are taken into account in the evaluation of colour. See <i>Colour</i> .
	Number of crushes (100-seed strips) for analysis Minimum—5 Optimum—10 Export—10
	Procedures See <i>Damage</i> .
Earth pellets (EP)	<ul style="list-style-type: none"> • Hard earth pellets are pellets that do not crumble under light pressure. See <i>Stones</i>. • Soft earth pellets are pellets that crumble under light pressure. See <i>Soft earth pellets</i>.
Ergot (ERG)	Ergot is a plant disease producing elongated fungus bodies with a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.
	Representative portion for analysis Minimum—100 g Optimum—500 g Export—500 g
Excreta (EXCR)	▲ Important: Wear gloves and a mask to handle any samples that you suspect may contain excreta.
	Representative portion for analysis Minimum—working sample Optimum—working sample Export—working sample
	Procedures <ul style="list-style-type: none"> • If the amount of excreta is not excessive, determine the kernel count. • If the kernel count is excessive, determine the weight of excreta as a percentage of the net weight of the sample.

**Fertilizer pellets
(FERT PLTS)**

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysis

Minimum—1000 g

Optimum—1000 g

Export—1000 g

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are considered as a separate grading factor in all grades of domestic mustard seed.
 - Grades of domestic mustard seed may contain one fertilizer pellet in 1000 g, including samples of commercially clean mustard seed.
 - Samples containing one fertilizer pellet per 500 g up to 1.0% are graded *Domestic Mustard Seed, Sample Canada Brown Account Fertilizer Pellets*.
 - Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Domestic Mustard Seed, Held IP Suspect Contaminated Grain*.

Important: For samples between 500 and 1000 g – if the sample contains one fertilizer pellet, the sample grades *Domestic Mustard Seed, Sample Canada Brown Account Fertilizer Pellets*. If the sample contains no fertilizer pellets, it is considered to be within the grade tolerance.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction “*Suspect Contaminated Grain, Handling Procedures*” for specific procedures to be followed when handling samples containing fertilizer pellets.

**Fireburnt kernels
(FBNT)**

Samples that show any evidence of being charred or scorched by fire are considered fireburnt. Evidence includes odour, pieces of charred wood, and so on. Fireburnt seeds pop when crushed.

Representative portion for analysisMinimum—working
sampleOptimum—working
sampleExport—working
sample**Procedures**

Samples considered fireburnt are graded *Domestic Mustard Seed, Sample Canada Brown Account Fireburnt*.

FrostSee *Damage*.**Green**See *Distinctly green*.

**Heated
kernels
(HTD)**

Heated refers only to seeds that are distinctly heated or badly binburnt. Heated seeds have a heated odour.

Crushed seeds may be

- Black—badly binburnt
- Dark chocolate brown—distinctly heated
- Light tan—slightly damaged from oxidation. If they have an odour or are present with brown or black crushed seeds, they are considered heated. Otherwise, they are included in *Total damage*, not heated.

Number of crushes (100-seed strips) for analysis

Minimum—5

Optimum—10

Export—10

Procedures

1. Examine 5 crushes for evidence of heating.
2. If no heated seeds detected, assess crushes for other damage. See *Damage*.
3. If at least 1 heated seed is detected, crush and assess an additional 5 crushes for heated seeds.

**Inconspicuous
admixture
(INC ADMX)**

In brown mustard seed, inconspicuous admixture includes

- Canola
- Common wild mustard seed
- Any other seeds that blend with brown mustard seed and are not readily identified

Representative portion for analysis

Minimum—5 g

Optimum—25 g

Export—5-25 g

▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analyses are confirmed by seed analysts.

**Mixed classes
(MXD CL)**

Samples are designated mixed classes when they contain sufficient quantities of other classes of mustard seed. See *Other classes*.

**Odour
(ODOR)**

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

If odour is the grade determinant and there is . . .	Then the grade is . . .
A distinct objectionable odour not associated with the quality of the grain, but not heated or fireburnt	<i>Domestic Mustard Seed, Sample Canada Brown, Account Odour</i>
A distinct heated odour	<i>Domestic Mustard Seed, Sample Canada Brown, Account Heated</i>
A distinct fireburnt odour	<i>Domestic Mustard Seed, Sample Canada Brown, Account Fireburnt</i>

**Other classes
(OCL)**

In brown mustard seed, other classes are yellow and oriental mustard seed.

If a sample contains more than 10.0% other classes, it is designated *Mixed*. Mixed mustard seed is graded according to all specifications except other classes, as in *Mustard Seed, No. 1 Canada Mixed*.

Representative portion for analysis

Minimum—2 g

Optimum—5 g

Export—2-5 g

Rime

Rime is the lining of the pod adhered to the seed. Seeds that are completely and densely covered with white rime are classed as damaged in any grade. Seeds with light rime sparsely covering the seed coat are

- Classed as sound if not otherwise damaged
- Considered in the evaluation of colour. See *Colour*.

Representative portion for analysis

Minimum—5 g

Optimum—10 g

Export—10 g

**Sclerotinia sclerotiorum
(SCL)**

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, and have a dark black exterior, a pure white interior, and a coarse surface texture.

Representative portion for analysis

Minimum—100 g

Optimum—500 g

Export—500 g

**Soft earth pellets
(SEP)**

Soft earth pellets are

- Earth pellets that crumble into fine dust under light pressure, using a finger only—if they do not crumble, they are considered *Stones*.
- Any non-toxic material of similar consistency

▲ **Important:** In domestic mustard seed, fertilizer pellets are not considered soft earth pellets. See *Fertilizer pellets*.

Representative portion for analysis

Minimum—100 g

Optimum—working
sample

Export—working
sample

**Stones
(STNS)**

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency.

Note: Fertilizer pellets are **not** assessed as stones in samples of Domestic Mustard Seed. See *Fertilizer pellets*.

Representative portion for analysis

Minimum—100 g

Optimum—working
sample

Export—working
sample

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
 2. Determine stone concentration in the net sample.
- In western Canada samples of grain containing stones in excess of “basic grade” tolerances, up to 2.5% are graded *Domestic Mustard Seed, Rejected “basic grade” Account Stones*. The “basic grade” refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
 - In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Domestic Mustard Seed, Sample Canada Brown Account Stones*.
 - In western and eastern Canada grain containing more than 2.5% stones is graded *Domestic Mustard Seed, Sample Salvage*.

Examples: Western Canada

Excerpt from grade determinant tables for
Domestic Mustard Seed, Brown, Canada

*Grade name	Stones %
No. 1 Canada	0.05
No. 2 Canada	0.05
No. 3 Canada	0.05
No. 4 Canada	0.10

*Defined in the *Canada Grain Regulations*

Basic grade:*Domestic Mustard Seed,
No. 2 Canada Brown*

Reason for basic grade:2.0% Distinctly green

If the above sample contained	Grade in western Canada
0.08% stones	<i>Domestic Mustard Seed, Rejected No. 2 Canada Brown Account Stones</i>
1.0% stones	<i>Domestic Mustard Seed, Rejected No. 2 Canada Brown Account Stones</i>
3.0% stones	<i>Domestic Mustard Seed, Sample Salvage</i>

Examples: Eastern Canada

Excerpt from grade determinant tables for
Domestic Mustard Seed, Brown, Canada

*Grade name	Stones %
No. 1 Canada	0.05
No. 2 Canada	0.05
No. 3 Canada	0.05
No. 4 Canada	0.10

*Defined in the *Canada Grain Regulations*

Basic grade: *Domestic Mustard Seed,
No. 2 Canada Brown*

Reason for basic grade: 2.0% Distinctly green

If the above sample contained	Grade in eastern Canada
0.08% stones	<i>Domestic Mustard Seed, No. 4 Canada Brown</i>
1.0% stones	<i>Domestic Mustard Seed, Sample Canada Brown Account Stones</i>
3.0% stones	<i>Domestic Mustard Seed, Sample Salvage</i>

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals—pink or red, canola—baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Domestic Mustard Seed, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspected Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

**Variety
(VAR)**

Domestic mustard seed is graded without reference to variety.

**Wild
mustard
(WM)**

Wild mustard seeds are classed as *Inconspicuous admixture*.

Representative portion for analysis

Minimum—5 g

Optimum—25 g

Export—5-25 g

▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analyses are confirmed by seed analysts.

Primary and export grade determinants tables

Domestic Mustard Seed, Brown, Canada (CAN)

*Grade name	Standard of quality			Damage		
	*Degree of soundness	*Other classes %	*Distinctly green %	*Heated %	*Total %	
No. 1 Canada	Reasonably well matured, sweet, good natural colour	0.5	1.5	0.1	1.5	
No. 2 Canada	Fairly well matured, sweet, reasonably good colour	2.0	2.0	0.2	3.0	
No. 3 Canada	May have the natural odour associated with low-quality seed, not any odour that would indicate serious deterioration	5.0	3.5	0.5	5.0	
No. 4 Canada	May have the natural odour associated with low-quality seed, not any odour that would indicate serious deterioration	10.0	3.5	1.0	10.0	
Grade, if No. 4 specs not met		Over 10.0%—use all other grading criteria and grade as Domestic Mustard Seed (grade) Mixed	Domestic Mustard Seed, Sample Canada Brown Account Damaged	Domestic Mustard Seed, Sample Canada Brown Account Heated		Domestic Mustard Seed, Sample Canada Brown Account Damaged

*Grade name	Conspicuous inseparable seeds										Soft earth pellets %	Excreta %	Ergot %	Stones %
	Inconspicuous admixture %	Distinctly detrimental				*Total %								
		Distinctly detrimental												
		Cow cockle %	Sclerotinia %	*Total distinctly detrimental %										
No. 1 Canada	1.0	0.1	0.1	0.1	0.3	0.05	1 K	0.01	0.05					
No. 2 Canada	1.0	0.2	0.2	0.2	0.5	0.05	1 K	0.2	0.05					
No. 3 Canada	1.0	0.3	0.3	0.3	0.7	0.05	1 K	0.3	0.05					
No. 4 Canada	1.0	1.0	1.0	1.0	3.0	0.05	0.005	1.0	0.10					
Grade, if No. 4 specs not met	Domestic Mustard Seed, Sample Canada Brown Account Admixture										Domestic Mustard Seed, Sample Canada Brown Account Admixture	Domestic Mustard Seed, Sample Canada Brown Account Excreta	Domestic Mustard Seed, Sample Canada Brown Account Ergot	2.5% or less—Domestic Mustard Seed, Rejected (grade) Brown Account Stones, or Domestic Mustard Seed, Sample Canada Brown Account Stones Over 2.5%—Domestic Mustard Seed, Sample Salvage

K Number of kernel-sized pieces in 500 g

*Defined in the Canada Grain Regulations Schedule III Table XXIII

Note: The class, whether yellow, oriental, brown or mixed, is added to the grade name.

Grading—oriental domestic mustard seed

Representative portion of oriental domestic mustard seed for grading, grams

Grading factor	Minimum	Optimum	Export
Blotched seeds	25	50	50
Canola	5	25	5-25
Cockle	5	50	5-50
Colour	working sample	working sample	working sample
Conspicuous admixture	5	50	5-50
Damage	5	10	10
Distinctly detrimental	5	50	5-50
Distinctly green	5 crushes	10 crushes	10 crushes
Ergot	100	500	500
Excreta	working sample	working sample	working sample
Fertilizer pellets	1000	1000	1000
Fireburnt	working sample	working sample	working sample
Heated	5 crushes	10 crushes	10 crushes
Inconspicuous admixture	5	25	5-25
Odour	working sample	working sample	working sample
Other classes	2	5	2-5
Rime	5	10	10
Sclerotinia sclerotiorum	100	500	500
Soft earth pellets	100	working sample	working sample
Stones	100	working sample	working sample
Wild mustard seed	5	25	5-25

Grading factors

Blotched seeds

Blotched seeds are oriental mustard seeds with black or brown discolourations on the seed coat.

- Seeds only partly discoloured but otherwise sound are considered sound, but the discolouration is taken into account in the evaluation of colour. See *Colour*.
- Seeds completely discoloured by blotch are considered damaged. See *Damage*.

Representative portion for analysis

Minimum—25 g

Optimum—50 g

Export—50 g

Canola (CNL)

In oriental mustard, canola is classed as *Inconspicuous admixture*.

- ▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analyses are confirmed by seed analysts.

Representative portion for analysis

Minimum—5 g

Optimum—25 g

Export—5-25 g

Classes

Domestic mustard seed is classed as yellow, brown or oriental, or mixed. The class forms part of the grade name; for example, *Domestic Mustard Seed, Sample Canola Oriental, Account Heated*. For a description of classes, see *Identifying classes of domestic mustard seed*.

Cockle (COC)

Cockle, or cow cockle, is a hard roundish seed with a dull surface covered with numerous small bumps giving the seed a rough spiky appearance. Colour can be deep black, bluish-black or orangish-brown. In oriental mustard, cockle is part of *Conspicuous admixture*.

Representative portion for analysis

Minimum—5 g

Optimum—50 g

Export—5-50 g

Procedures

Use a microscope to examine the sample.

Colour (CLR)

In analysing colour, consider

- The general degree of maturity
- The amount and degree of discolouration, such as from weathering
- The proportion of damaged seeds, which are distinctly green or otherwise colour-damaged. See *Damage* and *Distinctly green*.
- The amount of rime—light rime is considered in the overall appearance of the sample. See *Damage*.

Representative portion for analysisMinimum—working
sampleOptimum—working
sampleExport—working
sample**Conspicuous
admixture
(CADMX)**

Conspicuous admixture is called *Conspicuous inseparable seeds* in the grade determinants tables. In oriental mustard, conspicuous admixture includes

- Small seeds or broken seeds of other grains
- Weed seeds such as cow cockle, lamb's-quarters, ball mustard, pigweed, cleavers, smartweed and lady's thumb.
- Any conspicuous foreign material except stones and soft earth pellets

Representative portion for analysis

Minimum—5 g

Optimum—50 g

Export—5-50 g

▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analyses are confirmed by seed analysts.

**Contaminated
grain**

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the "*Canada Grain Act*" as: "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Domestic Mustard Seed, Sample Canada Oriental Condemned*.

**Damage
(DMG)**

Damaged seeds include those that are

- Distinctly shrunken or shrivelled
- Badly discoloured by mould
- Completely discoloured by blotch
- Completely and densely covered with rime
- Excessively weathered, sprouted, distinctly green, heated or otherwise damaged

Representative portion for analysis

Minimum—5 g

Optimum—10 g

Export—10 g

Number of crushes (100-seed strips) for analysis

Minimum—5

Optimum—10

Export—10

Procedures

1. Handpick the representative portion to determine the content of visually damaged seeds.
2. Determine the percentage by weight.

3. Crush the appropriate number of strips from the portion remaining.
A crush is made with only one pass of the roller under firm pressure.
4. Convert the count of damaged seeds on the strip to percentage by weight. Add the percentage of visually damaged seeds and crushed seeds for *Total damage*.

Distinctly detrimental (DDET)

Admixtures considered distinctly detrimental include

- Cow cockle
- Sclerotinia

Representative portion for analysis

Minimum—5 g

Optimum—50 g

Export—5-50 g

Distinctly green (DGR)

Distinctly green tolerances are applied to crushed seeds which are a distinct green throughout. Pale green or immature seeds are taken into account in the evaluation of colour. See *Colour*.

Number of crushes (100-seed strips) for analysis

Minimum—5

Optimum—10

Export—10

Procedures

See *Damage*.

Earth pellets (EP)

- Hard earth pellets are pellets that do not crumble under light pressure.
See *Stones*.
 - Soft earth pellets are pellets that crumble under light pressure.
See *Soft earth pellets*.
-

Ergot (ERG)

Ergot is a plant disease producing elongated fungus bodies with a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.

Representative portion for analysis

Minimum—100 g

Optimum—500 g

Export—500 g

Excreta (EXCR)

- ▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

Procedures

- If the amount of excreta is not excessive, determine the kernel count.
- If the kernel count is excessive, determine the weight of excreta as a percentage of the net weight of the sample.

**Fertilizer pellets
(FERT PLTS)**

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysis

Minimum—1000 g

Optimum—1000 g

Export—1000 g

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are considered as a separate grading factor in all grades of domestic mustard seed.
 - Grades of domestic mustard seed may contain one fertilizer pellet in 1000 g, including samples of commercially clean mustard seed.
 - Samples containing one fertilizer pellet per 500 g up to 1.0% are graded *Domestic Mustard Seed, Sample Canada Oriental Account Fertilizer Pellets*.
 - Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Domestic Mustard Seed, Held IP Suspect Contaminated Grain*.

Important: For samples between 500 and 1000 g – if the sample contains one fertilizer pellet, the sample grades *Domestic Mustard Seed, Sample Canada Oriental Account Fertilizer Pellets*. If the sample contains no fertilizer pellets, it is considered to be within the grade tolerance.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction “*Suspect Contaminated Grain, Handling Procedures*” for specific procedures to be followed when handling samples containing fertilizer pellets.

**Fireburnt kernels
(FBNT)**

Samples that show any evidence of being charred or scorched by fire are considered fireburnt. Evidence includes odour, pieces of charred wood, and so on. Fireburnt seeds pop when crushed.

Representative portion for analysisMinimum—working
sampleOptimum—working
sampleExport—working
sample**Procedures**

Samples considered fireburnt are graded *Domestic Mustard Seed, Sample Canada Oriental Account Fireburnt*.

FrostSee *Damage*.**Green**See *Distinctly green*.

Heated kernels (HTD)

Heated refers only to seeds that are distinctly heated or badly binburnt. Heated seeds have a heated odour.

Crushed seeds may be

- Black—badly binburnt
- Dark chocolate brown—distinctly heated
- Light tan—slightly damaged from oxidation. If they have an odour or are present with brown or black crushed seeds, they are considered heated. Otherwise, they are included in *Total damage*, not heated.

Number of crushes (100-seed strips) for analysis

Minimum—5

Optimum—10

Export—10

Procedures

1. Examine 5 crushes for evidence of heating.
2. If no heated seeds detected, assess crushes for other damage. See *Damage*.
3. If at least 1 heated seed is detected, crush and assess an additional 5 crushes for heated seeds.

Inconspicuous admixture (INC ADMX)

In oriental mustard seed, inconspicuous admixture includes

- Canola
- Common wild mustard seed
- Any other seeds that blend with oriental mustard seed and are not readily identified

Representative portion for analysis

Minimum—5 g

Optimum—25 g

Export—5-25 g

▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analyses are confirmed by seed analysts.

Mixed classes (MXD CL)

Samples are designated mixed classes when they contain sufficient quantities of other classes of mustard seed. See *Other classes*.

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

Representative portion for analysis

Minimum—working sample

Optimum—working sample

Export—working sample

If odour is the grade determinant and there is . . .	Then the grade is . . .
A distinct objectionable odour not associated with the quality of the grain, but not heated or fireburnt	<i>Domestic Mustard Seed, Sample Canada Oriental, Account Odour</i>
A distinct heated odour	<i>Domestic Mustard Seed, Sample Canada Oriental, Account Heated</i>
A distinct fireburnt odour	<i>Domestic Mustard Seed, Sample Canada Oriental, Account Fireburnt</i>

Other classes (OCL)

Other classes of domestic mustard seed in oriental mustard seed are yellow or brown.

If a sample contains more than 10.0% other classes, it is designated *Mixed*. Mixed mustard seed is graded according to all specifications except other classes, as in *Mustard Seed, No. 1 Canada Mixed*.

Other class	Tolerance
Brown	Working tolerance for seeds with brown hulls <ul style="list-style-type: none"> • For Canada No. 1 Oriental, 2.0% • For Canada No. 2, 3, 4 Oriental, 5.0%
Yellow	Considered <i>Mixed</i> if sample contains more than 10.0% of yellow mustard seed

Representative portion for analysis

Minimum—2 g

Optimum—5 g

Export—2-5 g

Rime

Rime is the lining of the pod adhered to the seed. Seeds that are completely and densely covered with white rime are classed as damaged in any grade. Seeds with light rime sparsely covering the seed coat are

- Considered sound if not otherwise damaged
- Considered in the evaluation of colour. See *Colour*.

Representative portion for analysis

Minimum—5 g

Optimum—10 g

Export—10 g

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, and have a dark black exterior, a pure white interior, and a coarse surface texture.

Representative portion for analysis

Minimum—100 g

Optimum—500 g

Export—500 g

Soft earth pellets (SEP)

Soft earth pellets are

- Earth pellets that crumble into fine dust under light pressure, using a finger only—if they do not crumble, they are considered *Stones*.
- Any non-toxic material of similar consistency

▲ **Important:** In domestic mustard seed, fertilizer pellets are not considered soft earth pellets. See *Fertilizer pellets*.

Representative portion for analysis

Minimum—100 g

Optimum—working
sample

Export—working
sample

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency.

Note: Fertilizer pellets are **not** assessed as stones in samples of Domestic Mustard Seed. See *Fertilizer pellets*.

Representative portion for analysis

Minimum—100 g

Optimum—working
sample

Export—working
sample

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
 2. Determine stone concentration in the net sample.
- In western Canada samples of grain containing stones in excess of “basic grade” tolerances, up to 2.5% are graded *Domestic Mustard Seed, Rejected “basic grade” Account Stones*. The “basic grade” refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
 - In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Domestic Mustard Seed, Sample Canada Oriental Account Stones*.
 - In western and eastern Canada grain containing more than 2.5% stones is graded *Domestic Mustard Seed, Sample Salvage*.

Examples: Western Canada

Excerpt from grade determinant tables for
Domestic Mustard Seed, Oriental, Canada

*Grade name	Stones %
No. 1 Canada	0.05
No. 2 Canada	0.05
No. 3 Canada	0.05
No. 4 Canada	0.10

*Defined in the *Canada Grain Regulations*

Basic grade:*Domestic Mustard Seed,
No. 2 Canada Oriental*

Reason for basic grade:2.0% Distinctly green

If the above sample contained	Grade in western Canada
0.08% stones	<i>Domestic Mustard Seed, Rejected No. 2 Canada Oriental Account Stones</i>
1.0% stones	<i>Domestic Mustard Seed, Rejected No. 2 Canada Oriental Account Stones</i>
3.0% stones	<i>Domestic Mustard Seed, Sample Salvage</i>

Examples: Eastern Canada

Excerpt from grade determinant tables for
Domestic Mustard Seed, Oriental, Canada

*Grade name	Stones %
No. 1 Canada	0.05
No. 2 Canada	0.05
No. 3 Canada	0.05
No. 4 Canada	0.10

* Defined in the *Canada Grain Regulations*

Basic grade: *Domestic Mustard Seed,
No. 2 Canada Oriental*

Reason for basic grade: 2.0% Distinctly green

If the above sample contained	Grade in eastern Canada
0.08% stones	<i>Domestic Mustard Seed, No. 4 Canada Oriental</i>
1.0% stones	<i>Domestic Mustard Seed, Sample Canada Oriental Account Stones</i>
3.0% stones	<i>Domestic Mustard Seed, Sample Salvage</i>

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals—pink or red, canola—baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Domestic Mustard Seed, Sample Canada Oriental Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspected Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

**Variety
(VAR)**

Domestic mustard seed is graded without reference to variety.

**Wild mustard
(WM)**

Wild mustard seeds are classed as *Inconspicuous admixture*.

Representative portion for analysis

Minimum—5 g

Optimum—25 g

Export—5-25 g

▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analyses are confirmed by seed analysts.

Primary and export grade determinants tables

Domestic Mustard Seed, Oriental, Canada (CAN)

*Grade name	Standard of quality			Damage		
	*Degree of soundness	*Other classes %	*Distinctly green %	*Heated %	*Total %	
No. 1 Canada	Reasonably well matured, sweet, good natural colour	0.5	1.5	0.1	1.5	
No. 2 Canada	Fairly well matured, sweet, reasonably good colour	2.0	1.5	0.2	3.0	
No. 3 Canada	May have the natural odour associated with low-quality seed, not any odour that would indicate serious deterioration	5.0	3.5	0.5	5.0	
No. 4 Canada	May have the natural odour associated with low-quality seed, not any odour that would indicate serious deterioration	10.0	3.5	1.0	10.0	
Grade, if No. 4 specs not met		Over 10.0%—use all other grading criteria and grade as <i>Domestic Mustard Seed (grade) Mixed</i>	<i>Domestic Mustard Seed, Sample Canada Oriental Account Damaged</i>	<i>Domestic Mustard Seed, Sample Canada Oriental Account Heated</i>	<i>Domestic Mustard Seed, Sample Canada Oriental Account Damaged</i>	

*Grade name	Conspicuous inseparable seeds					Stones %
	Inconspicuous admixture %	Distinctly detrimental			Ergot %	
		Cow cockle %	Sclerotinia %	*Total distinctly detrimental %		
No. 1 Canada	0.5	0.1	0.1	0.1	0.05	0.05
No. 2 Canada	1.0	0.2	0.2	0.2	0.05	0.05
No. 3 Canada	1.0	0.3	0.3	0.3	0.05	0.05
No. 4 Canada	1.0	1.0	1.0	1.0	0.05	0.10
Grade, if No. 4 specs not met	Domestic Mustard Seed, Sample Canada Oriental Account Admixture					2.5% or less—Domestic Mustard Seed, Rejected (grade) Oriental Account Stones, or Domestic Mustard Seed, Sample Canada Oriental Account Stones Over 2.5%—Domestic Mustard Seed, Sample Salvage
					Domestic Mustard Seed, Sample Canada Oriental Account Excreta	Domestic Mustard Seed, Sample Canada Oriental Account Admixture

K Number of kernel-sized pieces in 500 g

*Defined in the *Canada Grain Regulations* Schedule III Table XXIII

Note The class, whether yellow, oriental, brown or mixed, is added to the grade name

Grading—yellow domestic mustard seed

Representative portion of yellow domestic mustard seed for grading, grams

Grading factor	Minimum	Optimum	Export
Canola	5	25	5-25
Cockle	5	50	5-50
Colour	working sample	working sample	working sample
Conspicuous admixture	5	50	5-50
Damage	5	10	10
Distinctly detrimental	5	50	5-50
Distinctly green	5 crushes	10 crushes	10 crushes
Ergot	100	500	500
Excreta	working sample	working sample	working sample
Fertilizer pellets	1000	1000	1000
Fireburnt	working sample	working sample	working sample
Heated	5 crushes	10 crushes	10 crushes
Odour	working sample	working sample	working sample
Other classes	2	5	2-5
Other distinctly detrimental seeds	5	50	5-25
Rime	5	10	10
Sclerotinia sclerotiorum	100	500	500
Soft earth pellets	100	working sample	working sample
Stones	100	working sample	working sample
Wild mustard seed	5	25	5-25

Grading factors

**Canola
(CNL)**

In yellow mustard seed, canola is classed as *Distinctly detrimental*.

▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analyses are confirmed by seed analysts.

Representative portion for analysis

Minimum—5 g

Optimum—25 g

Export—5-25 g

Classes

Domestic mustard seed is classed as yellow, brown or oriental, or mixed. The class forms part of the grade name; for example, *Domestic Mustard Seed, Sample Canada Yellow, Account Heated*. For a description of classes, see *Identifying classes of domestic mustard seed*

**Cockle
(COC)**

Cockle, or cow cockle, is a hard roundish seed with a dull surface covered with numerous small bumps giving the seed a rough spiky appearance. Colour can be deep black, bluish-black or orangish-brown. In yellow mustard seed, cockle is considered *Distinctly detrimental* and included in *Total conspicuous inseparable seeds*.

Representative portion for analysis

Minimum—5 g

Optimum—50 g

Export—5-50 g

Procedures

Use a microscope to examine the sample.

**Colour
(CLR)**

In analysing colour, consider

- The general degree of maturity
- The amount and degree of discolouration, such as from weathering
- The proportion of damaged seeds, which are distinctly green or otherwise colour-damaged. See *Damage* and *Distinctly green*.
- The amount of dried white mucilage on yellow mustard seed—light or sparse mucilage is considered in the overall appearance of the sample. See *Damage*.

Representative portion for analysisMinimum—working
sampleOptimum—working
sampleExport—working
sample**Conspicuous
admixture
(CADMX)**

Conspicuous admixture is called *Conspicuous inseparable seeds* in the grade determinants tables. In yellow mustard seed, conspicuous admixture includes

- Seeds and foreign material designated as distinctly detrimental. See *Distinctly detrimental*
- Small seeds and broken kernels of other grains
- Weed seeds such as pigweed, lady's thumb, lamb's quarters and smartweed
- Any conspicuous foreign material except stones and soft earth pellets

Representative portion for analysis

Minimum—5 g

Optimum—50 g

Export—5-50 g

▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analyses are confirmed by seed analysts.

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the "*Canada Grain Act*" as: "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Domestic Mustard Seed, Sample Canada Yellow Condemned*.

Damage (DMG)

Damaged seeds include those that are

- Distinctly shrunken or shrivelled
- Badly discoloured from mould
- Completely and densely covered with rime or dried white mucilage. See *Colour*.
- Excessively weathered, sprouted, distinctly green, heated or otherwise damaged

Representative portion for analysis

Minimum—5 g

Optimum—10 g

Export—10 g

Number of crushes (100-seed strips) for analysis

Minimum—5

Optimum—10

Export—10

Procedures

1. Handpick the representative portion to determine the content of visually damaged seeds.
2. Determine the percentage by weight.
3. Crush the appropriate number of strips from the portion remaining.
A crush is made with only one pass of the roller under firm pressure.
4. Convert the count of damaged seeds on the strip to percentage by weight. Add this percentage of visually damaged seeds and crushed seeds for *Total damage*.

Distinctly detrimental (DDET)

Admixtures considered distinctly detrimental in yellow mustard seed include

- Cow cockle
- Sclerotinia
- Wild mustard, canola/rapeseed
- Other distinctly detrimental seeds (see *Other distinctly detrimental seeds*)

Ball mustard	Stinkweed or pennycress
Cleavers	Tansy mustard
Cockle	Tumbling mustard
Dog mustard	Wild buckwheat
Hare's ear mustard	Wormseed mustard

There are separate distinctly detrimental tolerances for cow cockle, sclerotinia and wild mustard in combination with canola or rapeseed and other distinctly detrimental seeds. All listed are included in the total of distinctly detrimental and total of conspicuous inseparable seeds.

Representative portion for analysis

Minimum—5 g

Optimum—50 g

Export—5-50 g

Distinctly green (DGR)

Distinctly green tolerances are applied to crushed seeds which are a distinct green throughout. Pale green or immature seeds are taken into account in the evaluation of colour. See *Colour*.

Number of crushes (100-seed strips) for analysis

Minimum—5

Optimum—10

Export—10

Procedures

See *Damage*.

Earth pellets (EP)

- Hard earth pellets are pellets that do not crumble under light pressure.
See *Stones*.
- Soft earth pellets are pellets that crumble under light pressure.
See *Soft earth pellets*.

Ergot (ERG)

Ergot is a plant disease producing elongated fungus bodies with a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.

Representative portion for analysis

Minimum—100 g

Optimum—500 g

Export—500 g

Excreta (EXCR)

- ▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Representative portion for analysis

Minimum—working sample

Optimum—working sample

Export—working sample

Procedures

- If the amount of excreta is not excessive, determine the kernel count.
- If the kernel count is excessive, determine the weight of excreta as a percentage of the net weight of the sample.

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysis

Minimum—1000 g Optimum—1000 g Export—1000 g

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are considered as a separate grading factor in all grades of domestic mustard seed.
 - Grades of domestic mustard seed may contain one fertilizer pellet in 1000 g, including samples of commercially clean mustard seed.
 - Samples containing one fertilizer pellet per 500 g up to 1.0% are graded *Domestic Mustard Seed, Sample Canada Yellow Account Fertilizer Pellets*.
 - Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Domestic Mustard Seed, Held IP Suspect Contaminated Grain*.

Important: For samples between 500 and 1000 g – if the sample contains one fertilizer pellet, the sample grades *Domestic Mustard Seed, Sample Canada Yellow Account Fertilizer Pellets*. If the sample contains no fertilizer pellets, it is considered to be within the grade tolerance.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction “*Suspect Contaminated Grain, Handling Procedures*” for specific procedures to be followed when handling samples containing fertilizer pellets.

Fireburnt kernels (FBNT)

Samples that show any evidence of being charred or scorched by fire are considered fireburnt. Evidence includes odour, pieces of charred wood, and so on. Fireburnt seeds pop when crushed.

Representative portion for analysis

Minimum—working sample Optimum—working sample Export—working sample

Procedures

Samples considered fireburnt are graded *Domestic Mustard Seed, Sample Canada Yellow Account Fireburnt*.

Frost	<i>See Damage.</i>
Green	<i>See Distinctly green.</i>
Heated kernels (HTD)	<p>Heated refers only to seeds that are distinctly heated or badly binburnt. Heated seeds have a heated odour.</p> <p>Crushed seeds may be</p> <ul style="list-style-type: none"> • Black—badly binburnt • Dark chocolate brown—distinctly heated • Light tan—slightly damaged from oxidation. If they have an odour or are present with brown or black crushed seeds, they are considered heated. Otherwise, they are included in <i>Total damage</i>, not heated. <p>Number of crushes (100-seed strips) for analysis</p> <p>Minimum—5 Optimum—10 Export—10</p> <p>Procedures</p> <ol style="list-style-type: none"> 1. Examine 5 crushes for evidence of heating. 2. If no heated seeds detected, assess crushes for other damage. <i>See Damage.</i> 3. If at least 1 heated seed is detected, crush and assess an additional 5 crushes for heated seeds.
Mixed classes (MXD CL)	Samples are designated mixed classes when they contain sufficient quantities of other classes of mustard seed. <i>See Other classes.</i>
Odour (ODOR)	<p>There is no numeric tolerance for odour. Consider</p> <ul style="list-style-type: none"> • The basic quality of the sample • The type and degree of the odour • The presence of visible residue causing the odour <p>Representative portion for analysis</p> <p>Minimum—working sample Optimum—working sample Export—working sample</p>

If odour is the grade determinant and there is . . .	Then the grade is . . .
A distinct objectionable odour not associated with the quality of the grain, but not heated or fireburnt	<i>Domestic Mustard Seed, Sample Canada Yellow, Account Odour</i>
A distinct heated odour	<i>Domestic Mustard Seed, Sample Canada Yellow, Account Heated</i>
A distinct fireburnt odour	<i>Domestic Mustard Seed, Sample Canada Yellow, Account Fireburnt</i>

Other classes (OCL)

Other classes of domestic mustard seed in yellow mustard seed are brown and oriental mustard seed.

If a sample contains more than 10.0% other classes, it is designated *Mixed*. Mixed mustard seed is graded according to all specifications except other classes, as in *Mustard seed, No. 1 Canada Mixed*.

Representative portion for analysis

Minimum—2 g

Optimum—5 g

Export—2-5 g

Other distinctly detrimental seeds (ODDET)

In yellow domestic mustard seed, the seeds listed below are considered *Other distinctly detrimental seeds*.

Ball mustard

Stinkweed or pennycress

Cleavers

Tansy mustard

Cockle

Tumbling mustard

Dog mustard

Wild buckwheat

Hare's ear mustard

Wormseed mustard

▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analysis are confirmed by seed analysts.

Representative portion for analysis

Minimum—5 g

Optimum—25 g

Export—5-25 g

Rime

Rime is the lining of the pod adhered to the seed. Seeds that are completely and densely covered with white rime are classed as damaged in any grade. Seeds with light rime sparsely covering the seed coat are

- Classed as sound if not otherwise damaged
- Considered in the evaluation of colour. See *Colour*.

Representative portion for analysis

Minimum—5 g

Optimum—10 g

Export—10 g

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, and have a dark black exterior, a pure white interior, and a coarse surface texture.

Representative portion for analysis

Minimum—100 g

Optimum—500 g

Export—500 g

Soft earth pellets (EP)

Soft earth pellets are

- Earth pellets that crumble into fine dust under light pressure, using a finger only— if they do not crumble, they are considered *Stones*.
- Any non-toxic material of similar consistency

▲ **Important:** In domestic mustard seed, fertilizer pellets are not considered soft earth pellets. See *Fertilizer pellets*.

Representative portion for analysis

Minimum—100 g

Optimum—working sample

Export—working sample

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency.

Note: Fertilizer pellets are **not** assessed as stones in samples of Domestic Mustard Seed. See *Fertilizer pellets*.

Representative portion for analysis

Minimum—100 g

Optimum— working sample

Export—working sample

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
 2. Determine stone concentration in the net sample.
- In western Canada samples of grain containing stones in excess of “basic grade” tolerances, up to 2.5% are graded *Domestic Mustard Seed, Rejected “basic grade” Account Stones*. The “basic grade” refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
 - In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Domestic Mustard Seed, Sample Canada Yellow Account Stones*.
 - In western and eastern Canada grain containing more than 2.5% stones is graded *Domestic Mustard Seed, Sample Salvage*.

Examples: Western Canada

Excerpt from grade determinant tables for
Domestic Mustard Seed, Yellow, Canada

*Grade name	Stones %
No. 1 Canada	0.05
No. 2 Canada	0.05
No. 3 Canada	0.05
No. 4 Canada	0.10

* Defined in the *Canada Grain Regulations*

Basic grade: *Domestic Mustard Seed,
No. 2 Canada Yellow*

Reason for basic grade: 2.0% Heated

If the above sample contained	Grade in western Canada
0.08% stones	<i>Domestic Mustard Seed, Rejected No. 2 Canada Yellow Account Stones</i>
1.0% stones	<i>Domestic Mustard Seed, Rejected No. 2 Canada Yellow Account Stones</i>
3.0% stones	<i>Domestic Mustard Seed, Sample Salvage</i>

Examples: Eastern Canada

Excerpt from grade determinant tables for
Domestic Mustard Seed, Yellow, Canada

*Grade name	Stones %
No. 1 Canada	0.05
No. 2 Canada	0.05
No. 3 Canada	0.05
No. 4 Canada	0.10

*Defined in the *Canada Grain Regulations*

Basic grade:Domestic Mustard Seed,
No. 2 Canada Yellow

Reason for basic grade:2.0% Heated

If the above sample contained	Grade in eastern Canada
0.08% stones	<i>Domestic Mustard Seed, No. 4 Canada Yellow</i>
1.0% stones	<i>Domestic Mustard Seed, Sample Canada Yellow Account Stones</i>
3.0% stones	<i>Domestic Mustard Seed, Sample Salvage</i>

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals—pink or red, canola—baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

- ▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample
---------------------------	---------------------------	--------------------------

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Domestic Mustard Seed, Sample Canada Yellow Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction “*Suspected Contaminated Grain, Handling Procedures*” for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

**Variety
(VAR)**

Domestic mustard seed is graded without reference to variety.

**Wild mustard
(WM)**

In yellow mustard, wild mustard seeds are classed as *Distinctly detrimental*.

Representative portion for analysis

Minimum—5 g	Optimum—25 g	Export—5-25 g
-------------	--------------	---------------

▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analyses are confirmed by seed analysts.

Primary and export grade determinants tables

Domestic Mustard Seed, Yellow, Canada (CAN)

*Grade name	Standard of quality			Damage		
	*Degree of soundness	*Other classes %	*Distinctly green %	*Heated %	*Total %	
No. 1 Canada	Reasonably well matured, sweet, good natural colour	0.5	1.5	0.1	1.5	
No. 2 Canada	Fairly well matured, sweet, reasonably good colour	2.0	1.5	0.2	3.0	
No. 3 Canada	May have the natural odour associated with low-quality seed, not any odour that would indicate serious deterioration	5.0	3.5	0.5	5.0	
No. 4 Canada	May have the natural odour associated with low-quality seed, not any odour that would indicate serious deterioration	10.0	3.5	1.0	10.0	
Grade, if No. 4 specs not met		Over 10.0%—use all other grading criteria and grade as Domestic Mustard Seed (grade) Mixed	Domestic Mustard Seed, Sample Canada Yellow Account Damaged	Domestic Mustard Seed, Sample Canada Yellow Account Heated	Domestic Mustard Seed, Sample Canada Yellow Account Damaged	

*Grade name	Conspicuous inseparable seeds						Ergot %	Excreta %	Soft earth pellets %	Stones %
	Distinctly detrimental					*Total %				
	Cow cockle %	Sclerotinia %	Wild mustard, canola/ rapeseed %	Other distinctly detrimental %	*Total distinctly detrimental %					
No. 1 Canada	0.1	0.1	0.1	0.1	0.1	0.3	0.05	1 K	0.01	0.05
No. 2 Canada	0.2	0.2	0.2	0.2	0.2	0.5	0.05	1 K	0.2	0.05
No. 3 Canada	0.3	0.3	0.3	0.3	0.3	0.7	0.05	1 K	0.3	0.05
No. 4 Canada	1.0	1.0	1.0	1.0	1.0	3.0	0.05	0.005	1.0	0.10
Grade, if No. 4 specs not met	Domestic Mustard Seed, Sample Canada Yellow Account Admixture						Domestic Mustard Seed, Sample Canada Yellow Account Ergot	Domestic Mustard Seed, Sample Canada Yellow Account Excreta	Domestic Mustard Seed, Sample Canada Yellow Account Admixture	2.5% or less—Domestic Mustard Seed, Rejected (grade) Yellow Account Stones, or Domestic Mustard Seed, Sample Canada Yellow Account Stones Over 2.5%—Domestic Mustard Seed, Sample Salvage

K Number of kernel-sized pieces in 500 g

*Defined in the Canada Grain Regulations Schedule III Table XXIII

Note: The class, whether yellow, oriental, brown or mixed, is added to the grade name

Export shipments

Export shipments can be commercially clean or not commercially clean.

Commercially clean

Shipments defined as commercially clean when the net dockage does not exceed 2.5% of the sample weight.

Dockage is reported to the nearest

- 0.1% for samples representing commercially clean shipments loaded from a single terminal or transfer elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal or transfer elevator

A deduction for broken and reasonably sound mustard seed handpicked from the material and removed as dockage is allowed

- On shipments not for direct export, of up to 0.50%
- On shipments for direct export, of up to 0.75%

Not commercially clean (NCC)

Shipments that do not meet the standards for commercial cleanliness are referred to as not commercially clean. Such shipments are allowed only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal and transfer elevators, dockage is reported to the nearest 0.1%. Instead of the allowances for broken seed in commercially clean shipments, a direct deduction of up to 0.2% is applied to establish net dockage.

Determination of dockage

Follow procedures for normal cleaning, with the Carter dockage tester set up as follows. You also need the No. .028 and No. .032 slotted hand sieves.

Setting	Export
Feed control	#3
Air control	#5
Riddle	No. 000
Top sieve	Blank tray
Centre sieve	None
Bottom sieve	None
Sieve cleaner control	Off

**Composition
of dockage**

In export domestic mustard seed shipments, dockage consists of

- Material other than mustard which passes over the No. 000 riddle or remains on top of the round-hole sieve
- Material that passes through the No. .028 or No. .032 slotted hand sieve, less the applicable allowance for broken or reasonably sound small whole mustard seed
- Material removed by aspiration

Grading

Domestic mustard seed on export is graded in accordance with export specifications. Where there are no export specifications, the primary specifications are used.

13. Buckwheat

Determining the size of buckwheat	13-3
Determination of dockage	13-4
Definition	13-4
Dockage not reported	13-4
Assessing dockage in small buckwheat	13-5
Normal cleaning procedures	13-5
Composition of dockage	13-5
Cleaning for grade improvement	13-5
Assessing dockage in large buckwheat	13-7
Normal cleaning procedure	13-7
Composition of dockage	13-7
Cleaning for grade improvement	13-7
Assessing dockage in processed large buckwheat	13-9
Normal cleaning procedure	13-9
Composition of dockage	13-9
Cleaning for grade improvement	13-9
Optional analysis	13-10
Grading	13-11
Important definitions	13-11
Net weight of sample	13-11
Kernel counts	13-11
Hazardous substances in samples	13-11
Representative portion for grading	13-12
Grading factors	13-13
Cereal grains	13-13
Contaminated grain	13-13
Damage	13-13
Dehulled	13-13
Earth pellets	13-12
Ergot	13-13
Excreta	13-14
Fertilizer pellets	13-14
Fireburnt	13-14
Immature	13-14
Matter other than cereal grains	13-15
Odour	13-15
Sclerotinia sclerotiorum	13-15
Size	13-15
Soft earth pellets	13-16
Stones	13-16
Treated seed and other chemical substances	13-18
Varieties	13-18

13. Buckwheat

Primary grade determinants tables	13-19
Buckwheat, Canada (CAN)	13-19
Export shipments	13-20
Commercially clean	13-20
Not commercially clean	13-20
Assessing dockage for small buckwheat	13-20
Assessing dockage for large buckwheat	13-21
Grading	13-21
Export grade determinants tables	13-22
Buckwheat, Canada (CAN)	13-22

Determining the size of buckwheat

1. Using a Boerner-type divider, divide a representative portion of approximately 250 g from the cleaned sample.
2. Set up the Carter dockage tester as follows.

Feed control	#6
Air control	Off
Riddle	None
Top sieve	No. 8 slotted
Centre sieve	Blank tray
Bottom sieve	None
Sieve cleaner control	Off

3. Turn on the Carter dockage tester.
4. Pour the portion into the hopper.
5. Turn off the Carter dockage tester.
6. Determine the percentage by weight of the kernels passing through the No. 8 slotted sieve.

If the percentage of kernels passing through the No. 8 slotted sieve is ...	Then the buckwheat is ...
20.0 or less	Large
More than 20.0	Small

Determination of dockage

Definition Dockage is assessed and recorded to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as “any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain.” Dockage is removed by following the cleaning procedures described in this section of the guide.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage is assessed in two stages.

1. Follow *Normal cleaning procedures*, using the Carter dockage tester.
2. Follow procedures for *Cleaning for grade improvement*. This cleaning can be done at any time after normal cleaning has been completed.

**Dockage
not reported**

▲ **Important:** Dockage is not reported for

- *Buckwheat, Sample Canada (size) Account Fireburnt*
- *Buckwheat, Sample Salvage*
- *Buckwheat, Sample Condemned*

Assessing dockage in small buckwheat

Normal cleaning procedures

- ▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

Buckwheat is considered small when more than 20.0% of the kernels pass through the No. 8 slotted sieve.

1. Set up the Carter dockage tester as follows:

Feed control	#6
Air control	#6
Riddle	No. 25
Top sieve	No. 6 buckwheat
Centre sieve	No. 5 buckwheat
Bottom sieve	No. 5 buckwheat
Sieve cleaner control	Off

2. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion of approximately 500 or 1000 g.
3. Turn on the Carter dockage tester.
4. Pour the sample into the hopper.
5. After the sample has passed through the machine, turn on the sieve cleaner control briefly to dislodge kernels.
6. Turn off the Carter dockage tester.
7. Snap the retainer rod of the aspiration pan lightly to loosen material gathered on the screen.
8. Determine dockage, using the list under *Composition of dockage*.

Composition of dockage

- Material other than whole kernels of buckwheat removed by the No. 25 riddle
- Material removed through the bottom No. 5 buckwheat sieve
- Material removed by aspiration other than whole kernels of buckwheat
- Soft earth pellets handpicked from the clean sample
- Material removed by cleaning for grade improvement

Cleaning for grade improvement

If the grade of a delivery can be improved by additional cleaning, perform the cleaning and add the additional material to dockage. Cleaning for grade improvement can be done at any time after normal cleaning.

1. After normal cleaning, examine the material to be removed and select your equipment according to the material you want to remove. See the table for the list of equipment.

2. Sieve the sample by hand using the No. 6 buckwheat hand sieve.

▲ **Important:** When you use a hand sieve, move the sieve from left to right 30 times, using a sifting motion. One time is one complete motion from the centre, to one side, to the other side, and back to the centre. The total distance from left to right is 20 cm, or about eight inches.

3. Weigh the additional dockage and add it to the original dockage.

Cleaning for grade improvement—Small buckwheat

Material to be removed	Equipment	Effect on composition of dockage
Foreign material	No. 6 buckwheat hand sieve	The material passing through the sieve is included in the dockage.

Assessing dockage in large buckwheat

Normal cleaning procedure

- ▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

Buckwheat is considered large when 20.0% or less of the kernels pass through the No. 8 slotted sieve.

1. Set up the Carter dockage tester as follows:

Feed control	#7
Air control	#6
Riddle	None
Top sieve	No. 15 round-hole
Centre sieve	No. 6 slotted
Bottom sieve	Blank tray
Sieve cleaner control	On

2. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion of approximately 500 or 1000 g.
3. Turn on the Carter dockage tester.
4. Pour the sample into the hopper.
5. Turn off the Carter dockage tester.
6. Determine dockage, using the list under *Composition of dockage*.

Composition of dockage

- Material other than whole kernels of buckwheat passing over the No. 15 round-hole sieve
- Material passing through the No. 6 slotted sieve
- Material removed by aspiration other than whole kernels of buckwheat
- Soft earth pellets handpicked from the cleaned sample
- Material removed by cleaning for grade improvement

Cleaning for grade improvement

If the grade of a delivery can be improved by additional cleaning, perform the cleaning and add the additional material to dockage. Cleaning for grade improvement can be done at any time after normal cleaning.

1. After normal cleaning, examine the material to be removed and select your equipment according to the material you want to remove. See the table for the list of equipment.

2. Sieve the sample by hand using the No. 8 slotted hand sieve.

▲ **Important:** When you use a hand sieve, move the sieve from left to right 30 times, using a sifting motion. One time is one complete motion from the centre, to one side, to the other side, and back to the centre. The total distance from left to right is 20 cm, or about eight inches.

3. Weigh the additional dockage and add it to the original dockage.

Cleaning for grade improvement—Large buckwheat

Material to be removed	Equipment	Effect on composition of dockage
Foreign material	No. 8 slotted hand sieve	The material passing through the sieve is included in the dockage.

Assessing dockage in processed large buckwheat

Processed buckwheat is buckwheat that

- Has been cleaned at a seed cleaning plant before being delivered to terminal or transfer elevators
- Contains the type of foreign material usually found after commercial cleaning, such as attritional material

Samples may contain foreign material such as Tartary buckwheat and barley.

Normal cleaning procedure

- ▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

1. Set up the Carter dockage tester as follows:

Feed control	#6
Air control	#3
Riddle	None
Top sieve	No. 6 slotted
Centre sieve	No. 4.5 round-hole
Bottom sieve	Blank tray
Sieve cleaner control	Off

2. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion of approximately 500 or 1000 g.
3. Turn on the Carter dockage tester.
4. Pour the sample into the hopper.
5. Turn off the Carter dockage tester.
6. Return all whole domestic buckwheat removed by aspiration to the cleaned sample.
7. Determine dockage, using the list under *Composition of dockage*.

Composition of dockage

- Material removed through the No. 4.5 round-hole sieve. Deduct up to 0.3% for fine attritional material. For example, if 0.95% of material is removed, record the amount as 0.65%.
- Buckwheat hulls and other material removed by aspiration, and material remaining on top of the #6 slotted sieve. Deduct up to 0.5% for broken or hulled buckwheat.
- Foreign material such as weed seeds, broken grain and roughage handpicked from the cleaned sample

Cleaning for grade improvement

Grade improvement procedures do not apply to samples of processed domestic buckwheat.

**Optional
analysis**

Where a shipper requests special cleaning of a carlot of grain at a terminal or transfer elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported and elevator stocks will be adjusted on the basis of the analysis.

Agreement of the shipper and unload elevator must be conveyed to the CGC in writing prior to the analysis being performed.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
 - The percentage by gross weight to the nearest 0.1% and the grade of buckwheat.
 - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
 - The percentage of dockage.

Example

95.0% Buckwheat, No. 1 CAN

4.0% Domestic Mustard Seed, No. 1 CAN Oriental

1.0% dockage

Grading

Important definitions

Net weight of sample	The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the net weight.
Kernel counts (K)	<p>A kernel count is the number of kernel-sized pieces in a 500 gram sample.</p> <ul style="list-style-type: none">• To do kernel counts, you must have 500 g of cleaned sample.• All grading is done on representative portions divided down from the cleaned sample using a Boerner-type divider.
Hazardous substances in samples	Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as “any pesticide, herbicide or desiccant.”

Representative portion for grading

All grading is done on representative portions divided down from the cleaned sample, using a Boerner-type divider.

When concentration of the grading factor is . . .	Then use . . .
Low	Optimum portion size
High	Minimum portion or more (do not use less)

Values in the table represent a range of recommended portions of samples for grading.

Representative portion of buckwheat for grading, grams

Grading factor	Minimum	Optimum	Export
Cereal grains	50	100	250
Damage	25	50	50
Dehulled	10	50	50
Ergot	500	1000	1000
Excreta	working sample	working sample	working sample
Fireburnt	500	working sample	working sample
Immature	25	50	50
Matter other than cereal grains	50	250	250
Odour	working sample	working sample	working sample
Sclerotinia sclerotiorum	500	1000	1000
Size	250	250	250
Soft earth pellets	working sample	working sample	working sample
Stones	250	500	1000

Grading factors

Cereal grains (CGRN)	Cereal grains in buckwheat include wheat, rye, triticale, barley, oats and groats, including wild oat groats that remain in the clean sample.
	Representative portion for analysis Minimum—50 g Optimum—100 g Export—250 g
Contaminated grain	<p>▲ Important: Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.</p> <p>Contaminated is defined in the “<i>Canada Grain Act</i>” as: “Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the <i>Food and Drugs Act</i>.”</p> <p>Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded <i>Buckwheat, Sample Condemned</i>.</p>
Damage (DMG)	<p>Damage includes all dehulled seeds and seeds that are frosted, mouldy, or otherwise unsound. The hull of damaged kernels collapses under pressure, as when rolled between the thumb and forefinger.</p> <p>Representative portion for analysis Minimum—25 g Optimum—50 g Export—50 g</p>
Dehulled (DHULL)	<p>Dehulled buckwheat is buckwheat with its hulls removed.</p> <p>Representative portion for analysis Minimum—10 g Optimum—50 g Export—50 g</p>
Earth pellets (EP)	<ul style="list-style-type: none"> • Hard earth pellets are pellets that do not crumble under light pressure. See <i>Stones</i>. • Soft earth pellets are pellets that crumble under light pressure. See <i>Soft earth pellets</i>.
Ergot (ERG)	<p>Ergot is a plant disease producing elongated fungal bodies that have a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.</p> <p>Representative portion for analysis Minimum—500 g Optimum—1000 g Export—1000 g</p>

**Excreta
(EXCR)**

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Representative portion for analysisMinimum—working
sampleOptimum—working
sampleExport—working
sample**Fertilizer
pellets
(FERT PLTS)**

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysisMinimum—working
sampleOptimum—working
sampleExport—working
sample**Procedures**

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Buckwheat, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction “*Suspect Contaminated Grain, Handling Procedures*” for procedures to be followed when handling samples containing fertilizer pellets.

**Fireburnt
(FBNT)**

Fireburnt samples are samples that contain kernels that show any evidence of being charred or scorched by fire.

Representative portion for analysis

Minimum—500 g

Optimum—working
sampleExport—working
sample**Immature
(IM)**

Immature kernels

- Do not contain a groat or have a severely shriveled groat
- Have a hull which collapses under pressure

Representative portion for analysis

Minimum—25 g

Optimum—50 g

Export—50 g

Matter other than cereal grains (MOTCG)

Matter other than cereal grains includes weed seeds and other grains that are not readily removable and may include peas, lentils, beans, corn, and other domestic or wild seeds that remain in the cleaned sample.

Representative portion for analysis

Minimum—50 g

Optimum—250 g

Export—250 g

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

Representative portion for analysis

Minimum—working sample

Optimum—working sample

Export—working sample

If odour is the grade determinant and there is ...	Then the grade is ...
A distinct objectionable odour not associated with the quality of the grain, but not heated or fireburnt	<i>Buckwheat, Sample Canada (size) Account Odour</i>
A distinct heated odour	<i>Buckwheat, Sample Canada (size) Account Heated</i>
A distinct fireburnt odour	<i>Buckwheat, Sample Canada (size) Account Fireburnt</i>

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a soil-borne fungus producing hard masses or sclerotia of fungal tissue. The sclerotia vary in size and shape, and have a dark black exterior, a pure white interior and a coarse surface texture.

Representative portion for analysis

Minimum—500 g

Optimum—1000 g

Export—1000 g

Size

Size is evaluated using a No. 8 slotted sieve. The size, large or small, is added to the grade name; for example, *Buckwheat, No. 1 Canada Large*.

If the percentage of kernels passing through the No. 8 slotted sieve is ...	Then the buckwheat is ...
20.0 or less	Large
More than 20.0	Small

Representative portion for analysis

Minimum—250 g

Optimum—250 g

Export—250 g

Soft earth pellets (SEP)

Soft earth pellets are

- Earth pellets that crumble into fine dust under light pressure, using a finger only— if they do not crumble, they are considered *Stones*.
- Any non-toxic material of similar consistency

Representative portion for analysis

Minimum—working sample

Optimum—working sample

Export—working sample

Procedures

1. Handpick soft earth pellets from a representative portion of the cleaned sample.
2. Soft earth pellets are removed as dockage. See *Composition of dockage*.

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Representative portion for analysis

Minimum—250 g

Optimum—500 g

Export—1000 g

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.
 - In western Canada samples of grain containing stones in excess of “basic grade” tolerances, up to 2.5% are graded *Buckwheat, Rejected “basic grade” Account Stones*. The “basic grade” refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
 - In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Buckwheat, Sample Canada Account Stones*.
 - In western and eastern Canada grain containing more than 2.5% stones is graded *Buckwheat, Sample Salvage*.

Examples: Western Canada

Excerpt from grade determinant tables for
Buckwheat, Canada

*Grade name	Stones
No. 1 Canada	3K
No. 2 Canada	3K
No. 3 Canada	3K

* Defined in the *Canada Grain Regulations*
K Number of kernel-sized pieces in 500 g

Basic grade:*Buckwheat, No. 2 Canada Large*

Reason for basic grade:2.0% Dehulled

If the above sample contained	Grade in western Canada
6K stones	<i>Buckwheat, Rejected No. 2 Canada Large Account Stones</i>
3.0% stones	<i>Buckwheat, Sample Salvage</i>

Examples: Eastern Canada

Excerpt from grade determinant tables for
Buckwheat, Canada

*Grade name	Stones
No. 1 Canada	3K
No. 2 Canada	3K
No. 3 Canada	3K

* Defined in the *Canada Grain Regulations*
K Number of kernel-sized pieces in 500 g

Basic grade:*Buckwheat, No. 2 Canada Large*

Reason for basic grade:2.0% Dehulled

If the above sample contained	Grade in eastern Canada
6K stones	<i>Buckwheat, Sample Canada Large Account Stones</i>
3.0% stones	<i>Buckwheat, Sample Salvage</i>

**Treated seed
and other
chemical
substances**
Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals—pink or red, canola—baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Buckwheat, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction “*Suspected Contaminated Grain, Handling Procedures*” for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Varieties

Any variety of buckwheat registered for production in Canada is eligible for the grade of No. 1 Canada.

Primary grade determinants tables

Buckwheat, Canada (CAN)

*Grade name	*Minimum test weight kg/hL (g/0.5 L)	*Degree of soundness	Damage			Foreign material					
			*Dehulled %	*Immature %	*Total %	*Cereal grains %	Ergot %	*Matter other than cereal grains %	Sclerotinia %	Stones %	*Total %
No. 1 Canada	58.0 (285)	Cool and sweet	1.0	1.5	4.0	1.0	Nil	0.2	Nil	3K	1.0
No. 2 Canada	55.0 (270)	Cool and sweet	2.0	1.5	8.0	2.5	0.05	1.0	0.05	3K	3.0
No. 3 Canada	—	May have a ground or grassy odour, not musty or sour	5.0	5.0	20.0	5.0	0.25	2.0	0.25	3K	5.0
Grade, if No. 3 specs not met			Buckwheat, Sample Account Damage	Buckwheat, Sample Canada Damage	Buckwheat, Sample Canada (size)	Buckwheat, Sample Canada (size) Account Admixture	Buckwheat, Sample Canada (size) Ergot	Buckwheat, Sample Canada (size) Account Admixture	Buckwheat, Sample Canada (size) Account Admixture	2.5% or less— Buckwheat, Rejected (grade) (size) Account Stones, or Buckwheat, Sample Canada (size) Account Stones Over 2.5%— Buckwheat, Sample Salvage	Buckwheat, Sample Canada (size) Account Admixture

* Defined in the *Canada Grain Regulations* Schedule III Table X'VIII

K Number of kernel-sized pieces in 500 g

Note: The size may be added to the grade name

Export shipments

Export shipments can be commercially clean or not commercially clean.

Commercially clean

Shipments defined as commercially clean when the net dockage does not exceed 2.5% of the sample weight.

Any whole domestic buckwheat removed in dockage assessment is returned to the clean sample. Dockage in shipments is reduced by up to

- 0.3% for fine attritional material which passes through the No. 4.5 round-hole sieve
- 0.5% for broken or hulled buckwheat removed by aspiration or passing through the No. 5 buckwheat or the No. 6 slotted sieve

Not commercially clean (NCC)

Shipments that do not meet the standards for commercial cleanliness are referred to as *not commercially clean*. Such shipments are permitted only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal and transfer elevators, dockage is reported to the nearest 0.1%, less a deduction of up to 0.2%.

Assessing dockage for small buckwheat

Follow the primary dockage assessment procedures, with the Carter dockage tester set as follows.

Feed control	#6
Air control	#3
Riddle	
Top sieve	No. 5 buckwheat
Centre sieve	No. 4.5 round-hole
Bottom sieve	Blank tray
Sieve cleaner control	

Dockage consists of the following:

- Material other than whole domestic buckwheat which passes through the No. 5 buckwheat or the No. 6 slotted sieve, less fine attritional material, broken or hulled buckwheat constituting not more than 0.5% of the sample by weight
- Material in excess of grade tolerances which is handpicked from the cleaned sample, other than cereal grains

**Assessing
dockage for
large
buckwheat**

Follow the primary dockage assessment procedures, with the Carter dockage tester set as follows.

Feed control	#6
Air control	#3
Riddle	
Top sieve	No. 6 slotted
Centre sieve	No. 4.5 round-hole
Bottom sieve	Blank tray
Sieve cleaner control	

Dockage consists of the following

- Material other than whole domestic buckwheat that passes through the No. 6 slotted sieve, less fine attritional material, broken or hulled buckwheat constituting not more than 0.5% of the sample by weight
- Material in excess of grade tolerances which is removed by aspiration, other than whole domestic buckwheat
- Material in excess of grade tolerances which is handpicked from the cleaned sample, other than cereal grains

Grading

Buckwheat on export is graded in accordance with export grade specifications.

Export grade determinants tables

Buckwheat, Canada (CAN)

Grade name	Total removable material %	Damage			Foreign material					Total %
		Dehulled %	Immature %	Total %	Cereal grains %	Ergot %	Matter other than cereal grains %	Sclerotinia %	Stones %	
No. 1 Canada	2.5	1.0	1.5	4.0	1.0	Nil	0.2	Nil	3K	1.0
No. 2 Canada	2.5	2.0	1.5	8.0	2.5	0.05	1.0	0.05	3K	3.0
No. 3 Canada	2.5	5.0	5.0	20.0	5.0	0.25	2.0	0.25	3K	5.0

K Number of kernel-sized pieces in 500 g

14. Sunflower seed

Determination of dockage	14-2
Definitions	14-2
Dockage not reported	14-2
Normal cleaning procedures	14-2
Composition of dockage	14-3
Optional analysis	14-3
Grading	14-4
Important definitions	14-4
Net weight of sample	14-4
Kernel counts	14-4
Hazardous substances in samples	14-4
Representative portion sizes for grading	14-5
Grading factors	14-6
Contaminated seed	14-6
Damage	14-6
Dehulled	14-6
Earth pellets	14-6
Ergot	14-6
Excreta	14-7
Fertilizer pellets	14-7
Fireburnt	14-7
Foreign material	14-7
Head rot damage	14-7
Heated, rotted or musty	14-8
Insect damage	14-8
Odour	14-8
Other grains	14-9
Sclerotinia sclerotiorum	14-9
Soft earth pellets	14-9
Stones	14-10
Treated seed and other chemical substances	14-11
Varieties	14-12
Primary and export grade determinants	14-13
Sunflower seed, Canada confectionery	14-13
Sunflower seed, Canada oil	14-14
Export shipments	14-15
Commercially clean	14-15
Not commercially clean	14-15
Grading	14-15

Determination of dockage

Definitions Dockage is assessed and recorded to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as “any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain.” Dockage is removed by following the cleaning procedures described in this section of the guide.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage not reported

▲ **Important:** Dockage is not reported for samples grading

- *Sunflower Seed, Sample Canada Account Fireburnt*
- *Sunflower Seed, Sample Salvage*
- *Sunflower Seed, Sample Condemned*

Normal cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

1. Set up the Carter dockage tester as follows:

Feed control	#7 #9 for large-seeded varieties
Air control	#5
Riddle	none
Top sieve	none
Centre sieve	blank tray
Bottom sieve	none
Sieve cleaner control	none

2. Using a Boerner-type divider, divide the uncleaned sample to obtain two or more representative portions of approximately 250 g. Clean these samples individually.
3. Nest the No. 18 round-hole sieve over one of the following sieves, depending on the size of the seeds:
 - the No. 10 round-hole sieve
 - the No. 6 buckwheat sieve
4. Sieve the portion.
5. Pass through the Carter dockage tester the material which has passed through the No. 18 round-hole sieve and remains on top of the No. 10 round-hole sieve (or the No. 6 buckwheat sieve).

6. Using a Boerner-type divider, divide a smaller portion of 50 g.
7. Handpick the 50-g portion for foreign material, including broken hulls, which are assessed as dockage up to the established grade tolerances.
8. From the 50-g portion, determine the percentage by weight of foreign material.
9. Handpick from the material remaining on top of the No. 18 round-hole sieve all whole or broken sunflower seeds. Return them to the cleaned sample.
10. Determine dockage, using the list under *Composition of dockage*.

Composition of dockage

- Foreign material removed by either the #24 or #18 round-hole sieve
- Material removed by aspiration, except sound whole sunflower seeds
- Material passing through either the No. 10 round-hole sieve or the No. 6 buckwheat sieve
- Coarse material handpicked from the sieved sample
- Other grains handpicked from the sieved sample up to 2.5%
- Earth pellets, other grains and sclerotia up to established tolerances handpicked from the clean sample.

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal or transfer elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported and elevator stocks will be adjusted on the basis of the analysis. Agreement of the shipper and unload elevator must be conveyed to the CGC in writing prior to the analysis being performed.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
 - The percentage by gross weight to the nearest 0.1% and the grade of sunflower seed.
 - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
 - The percentage of dockage.

Example

95.0% Sunflower Seed, No. 1 CAN Confectionary
 4.0% Domestic Mustard Seed, No. 1 CAN Oriental
 1.0% dockage

Grading

Important definitions

Net weight of sample The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the cleaned sample, the net weight.

Kernel counts (K) The kernel count is the number of kernel-sized pieces of foreign material in a sample.

- To do kernel counts, you must have 500 grams of cleaned sample.
- All grading is done on representative portions divided down from the cleaned sample using a Boerner-type divider.

Hazardous substances in samples Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations sample.as “any pesticide, herbicide or desiccant.”

Representative portion sizes for grading

All grading is done on representative portions divided down from the cleaned sample, using a Boerner-type divider.

When the grading factor is . . .	Then use . . .
Normal	Optimum portion size
Severe	Minimum portion size or more (do not use less)

Values in this table represent a range of recommended portions of samples for grading.

Representative portion of sunflower seed for grading, grams

Grading factor	Minimum	Optimum	Export
Damage	100	100	100
Dehulled	500	1000	1000
Ergot	500	1000	1000
Excreta	working sample	working sample	working sample
Fireburnt	500	working sample	working sample
Heated, rotted, mouldy	100	100	100
Head rot (hulls)	25	100	100
Head rot (seeds)	5	25	25
Insect damage	100	100	100
Odour	working sample	working sample	working sample
Other grains	50	100	100
Sclerotinia sclerotiorum	250	1000	1000
Soft earth pellets	100	100	100
Stones	250	500	1000

Grading factors

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the "*Canada Grain Act*" as; "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Sunflower Seed, Sample Condemned*.

Damage (DMG)

Damaged seeds show at least one of following characteristics:

- Head rot damage
- Heated, rotted or mouldy
- Very immature
- Insect-damaged
- Otherwise materially damaged

Representative portion for analysis

Minimum—100 g

Optimum—100 g

Export—100 g

Dehulled (DHULL)

Hulled seeds are broken and whole seeds that are without hulls.

Representative portion for analysis

Minimum—500 g

Optimum—1000 g

Export—1000 g

Earth pellets

- Hard earth pellets are pellets that do not crumble under light pressure.
See Stones.
- Soft earth pellets are pellets that crumble under light pressure.
See Soft earth pellets.

Ergot (ERG)

Ergot is a plant disease producing elongated fungal bodies that have a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.

Representative portion for analysis

Minimum—500 g

Optimum—1000 g

Export—1000 g

**Excreta
(EXCR)**

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Representative portion for analysisMinimum—working
sampleOptimum—working
sampleExport—working
sample**Fertilizer
pellets
(FERT PLTS)**

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysisMinimum—working
sampleOptimum—working
sampleExport—working
sample**Procedures**

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Sunflower Seed, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction “*Suspect Contaminated Grain, Handling Procedures*” for procedures to be followed when handling samples containing fertilizer pellets.

**Fireburnt
(FBNT)**

Fireburnt seeds are those that show any signs of being charred or scorched by fire.

Representative portion for analysis

Minimum—500 g

Optimum—working
sampleExport—working
sample**Foreign
material
(FM)**

Foreign material in sunflower seed includes other grains, sclerotinia and stones.

**Head rot
damage**

Head rot is damage most frequently caused by sclerotinia head rot disease.

Damage includes

- Hulls with 50% or more of the surface covered by white patches
- Seeds that are off colour, e.g., tan to dark brown
- Seeds that may contain small black sclerotia

Representative portion for analysis**Hulls**

Minimum—25 g

Optimum—100 g

Exports—100 g

Seeds

Minimum—5 g

Optimum—25 g

Exports—25 g

Procedures

1. Using a Boerner-type divider, divide a representative portion for hulls.
2. Examine the portion and remove hulls with white patches covering 50% or more of the hull.
3. Divide the remaining representative portion for a subsample not less than 5 g.
4. Remove the hulls and examine the seeds for off-colour and the presence of sclerotia.

**Heated,
rotted
or musty
(HTD)**

Heated seeds have the colour and or odour typical of seeds that have heated in storage or have been damaged by artificial drying.

Representative portion for analysis

Minimum—100 g

Optimum—100 g

Export—100 g

Procedures

1. Pass the representative portion of the clean sample through a barley pearler for 3 to 5 seconds.
2. Separate heated, rotted or musty kernels from sound kernels.

If you are unsure whether the kernel is heated, rotted or musty, cut the seed lengthwise and examine the exposed meat. Brown-coloured meat is considered to be heated.

**Insect damage
(I DMG)**

Insect-damaged seeds have hull perforations of any size caused by insects and include any hulled seeds which have been bored or chewed by insects.

Representative portion for analysis

Minimum—100 g

Optimum—100 g

Export—100 g

**Odour
(ODOR)**

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

Representative portion for analysisMinimum—working
sampleOptimum—working
sampleExport—working
sample

If odour is the grade determinant and there is . . .	Then the grade is . . .
An excessive objectionable odour not associated with the quality of the grain, but not heated or fireburnt	<i>Sunflower, Sample Canada Account Odour</i>
An excessive heated odour	<i>Sunflower, Sample Canada Account Heated</i>
An excessive fireburnt odour	<i>Sunflower, Sample Canada Account Fireburnt</i>

Other grains (OGS)

Other grains are any other grains that are not removed during cleaning.

In samples eligible for off-grades, other grains are considered a grading factor and are not added to the dockage.

Representative portion for analysis

Minimum—50 g

Optimum—100 g

Export—100 g

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, and have a dark black exterior, a pure white interior, and a coarse surface texture.

Representative portion for analysis

Minimum—250 g

Optimum—1000 g

Export—1000 g

Soft earth pellets (SEP)

Soft earth pellets are pellets that crumble under light pressure from a finger—if they do not crumble, they are considered stones. These pellets can be

- Earth and fertilizer pellets
- Any non-toxic material of similar consistency

Procedures

Earth pellets may be removed as dockage. See *Normal cleaning procedures*.

If soft earth pellets are over 2.5% of the gross weight of the sample, they become a grading factor, included in the tolerance of *Foreign material*.

1. Return the pellets to the sample.
2. Handpick soft earth pellets from a representative portion of 100 g of the cleaned sample.
3. If soft earth pellets is the grade determinant, grade the sample *Sunflower Seed, Sample Canada Account Admixture*.

Representative portion for analysis

Minimum—100g

Optimum—100 g

Export—100 g

**Stones
(STNS)**

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Representative portion for analysis

Minimum—250 g

Optimum—500 g

Export—1000 g

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
 2. Determine stone concentration in the net sample.
- In western Canada samples of grain containing stones in excess of “basic grade” tolerances, up to 2.5% are graded *Sunflower Seed, Rejected “basic grade” Account Stones*. The “basic grade” refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
 - In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Sunflower Seed, Sample Canada Account Stones*.
 - In western and eastern Canada grain containing more than 2.5% stones is graded *Sunflower Seed, Sample Salvage*.

Examples: Western Canada

Excerpt from grade determinant tables for
Sunflower Seed, Canada, Oil

*Grade name	Stones
No. 1 Canada	3K
No. 2 Canada	3K

* Defined in the *Canada Grain Regulations*

K Number of kernel-sized pieces in 500 g

Basic grade:*Sunflower Seed, No. 1 Canada, Oil*

If the above sample contained	Grade in western Canada
6K stones	<i>Sunflower Seed, Rejected No. 1 Canada Oil Account Stones</i>
3.0% stones	<i>Sunflower Seed, Sample Salvage</i>

Examples: Eastern Canada

Excerpt from grade determinant tables for
Sunflower Seed, Canada, Oil

*Grade name	Stones
No. 1 Canada	3K
No. 2 Canada	3K

* Defined in the *Canada Grain Regulations*

K Number of kernel-sized pieces in 500 g

Basic grade:*Sunflower Seed, No. 1 Canada, Oil*

If the above sample contained	Grade in eastern Canada
6K stones	<i>Sunflower Seed, Sample Canada Account Stones</i>
3.0% stones	<i>Sunflower Seed, Sample Salvage</i>

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals—pink or red, canola—baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Sunflower Seed, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspected Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Varieties

Sunflower seed is graded according to end use, either confectionary or oil.

On written request, the name of the variety as described by the owner or shipper may be shown as a notation in the remarks section of a certificate; for example, Said to be Commander variety.

Primary and export grade determinants tables

Sunflower Seed, Canada Confectionery (CAN)

*Grade name	Standard of quality		Damage					*Dehulled seeds %	Foreign material			
	*Minimum test weight (kg/hL)	*Degree of soundness	Head rot %	*Heated %	*Insect damage %	*Total %	Other grains %		Sclerotinia %	Soft earth pellets %	Stones	
No. 1 Canada	31.0	Well matured and sweet	2.0	0.5	2.0	4.0	5.0	2.5	1.0	2.5	3K	
No. 2 Canada	29.0	Reasonably well matured and sweet	5.0	1.0	4.0	8.0	5.0	2.5	2.0	2.5	3K	
Grade, if No. 2 specs not met	Sunflower Seed, Sample Canada Account Light Weight		Sunflower Seed, Sample Canada Account Damage	Sunflower Seed, Sample Canada Account Heated	Sunflower Seed, Sample Canada Account Insect Damage	Sunflower Seed, Sample Canada Account Damaged	Sunflower Seed, Sample Canada Account Dehulled	Sunflower Seed, Sample Canada Account Admixture	Sunflower Seed, Sample Canada Account Admixture	Sunflower Seed, Sample Canada Account Admixture	2.5% or less—Sunflower Seed, Rejected (grade) Account Stones, or Sunflower Seed, Sample Canada Account Stones Over 2.5%—Sunflower Seed, Sample Salvage	

* Defined in the Canada Grain Regulations Schedule III Table XVII

K Number of kernel-sized pieces in 500 g

Sunflower Seed, Canada Oil (CAN)

*Grade name	Standard of quality		Damage				*Dehulled seeds %	Foreign material		
	*Minimum test weight (kg/hL)	*Degree of soundness	Head rot %	*Heated %	*Insect damage %	*Total %		Other grains %	Sclerotinia %	Soft earth pellets %
No. 1 Canada	35.0	Well matured and sweet	2.0	0.5	2.0	5.0	5.0	2.5	1.0	2.5
No. 2 Canada	31.0	Reasonably well matured and sweet	5.0	1.0	4.0	10.0	5.0	2.5	2.0	2.5
Grade, if No. 2 specs not met	Sunflower Seed, Sample Canada Account Light Weight		Sunflower Seed, Sample Canada Account Damaged	Sunflower Seed, Sample Canada Account Heated	Sunflower Seed, Sample Canada Account Insect Damage	Sunflower Seed, Sample Canada Account Damaged	Sunflower Seed, Sample Canada Account Dehulled	Sunflower Seed, Sample Canada Account Admixture	Sunflower Seed, Sample Canada Account Admixture	Sunflower Seed, Sample Canada Account Admixture
										2.5% or less—Sunflower Seed, Rejected (grade) Account Stones or Sunflower Seed, Sample Canada Account Stones Over 2.5%—Sunflower Seed, Sample Salvage

* Defined in the Canada Grain Regulations Schedule III Table XVII.1

K Number of kernel-sized pieces in 500 g

Export shipments

Export shipments can be commercially clean or not commercially clean.

Commercially clean (CC)

Shipments with dockage levels up to 5.0% are considered commercially clean.

Dockage is reported to the nearest

- 0.1% for samples representing commercially clean shipments loaded from a single terminal or transfer elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal or transfer elevator

Not commercially clean (NCC)

Shipments that do not meet the standards for commercial cleanliness are referred to as not commercially clean. Such shipments are permitted only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal and transfer elevators, dockage is reported to the nearest 0.1%. A direct deduction of up to 0.2% is applied to take into account the buildup of attritional material. Dockage is assessed using procedures for primary samples.

Attritional material is dust and other material that accumulates in grain as it moves through the handling system. It is assessed with the 4.5 round-hole sieve.

Grading

Sunflower seed on export is graded in accordance with primary grade standards and specifications.

15. Safflower seed

Determination of dockage	15-2
Definitions	15-2
Dockage not reported for	15-2
Normal cleaning procedures	15-2
Composition of dockage	15-3
Optional analysis	15-3
Grading	15-4
Important definitions	15-4
Net weight of sample	15-4
Kernel counts	15-4
Hazardous substances in samples	15-4
Representative portion for grading	15-4
Grading factors	15-5
Contaminated grain	15-5
Damage	15-5
Dehulled	15-5
Earth pellets	15-5
Empty hulls	15-5
Excreta	15-5
Fertilizer pellets	15-6
Foreign material	15-6
Heated	15-6
Matter other than cereal grains	15-6
Odour	15-6
Other grains	15-7
Rotted	15-7
Soft earth pellets	15-7
Stones	15-7
Treated seed and other chemical substances	15-9
Varieties	15-10
Primary and export grade determinants	15-11
Safflower seed, Canada	15-11
Export shipments	15-12
Commercially clean	15-12
Not commercially clean	15-12
Grading	15-12

Determination of dockage

Definitions Dockage is assessed and recorded to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as “any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain.” Dockage is removed by following the cleaning procedures described in this section of the guide.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage not reported

- ▲ **Important:** Dockage is not reported for
- *Safflower Seed, Sample Canada Account Fireburnt*
 - *Safflower Seed Sample Salvage*
 - *Safflower Seed, Sample Condemned*

Normal cleaning procedures

- ▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

1. Set up the Carter dockage tester as follows:

Feed control	#7
Air control	#7
Riddle	none
Top sieve	blank
Centre sieve	none
Bottom sieve	none
Sieve cleaner control	

2. Using a Boerner-type divider, divide the uncleaned sample to obtain two representative portions of approximately 250 g. Clean each portion individually.
3. Sift the sample over a No. 15 round-hole sieve nested over a No. 6 slotted sieve or a No. 6 buckwheat sieve or both, with a blank sieve on the bottom.
4. Turn on the Carter dockage tester.
5. Pour into the hopper the part of the sample that has passed through the No. 15 round-hole sieve.
6. From the material remaining on the top of the No. 15 round-hole sieve, handpick all whole or broken safflower seeds and return them to the cleaned sample.
7. Determine dockage, using the list that follows, under *Composition of dockage*.

**Composition
of dockage**

- Foreign material removed by the No. 15 round-hole sieve
- Material removed by the No. 6 slotted, the No. 6 buckwheat sieve, or both
- Material removed by aspiration; except sound whole safflower seeds
- Soft earth pellets handpicked from the clean sample constituting up to 2.5% of the sample by weight—if the percentage of soft earth pellets is 2.5% or more, soft earth pellets becomes a grading factor.

**Optional
analysis**

Where a shipper requests special cleaning of a carlot of grain at a terminal or transfer elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported and elevator stocks will be adjusted on the basis of the analysis.

Agreement of the shipper and unload elevator must be conveyed to the CGC in writing prior to the analysis being performed.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
 - The percentage by gross weight to the nearest 0.1% and the grade of safflower seed.
 - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
 - The percentage of dockage.

Example

95.0% Safflower Seed, No. 1 CAN

4.0% Domestic Mustard Seed, No. 1 CAN Oriental

1.0% dockage

Grading

Important definitions

Net weight of sample The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the cleaned sample, the net weight.

Kernel counts (K) A kernel count is the number of kernel-sized pieces of a foreign material in 500 g of a sample.

- To do kernel counts you must have 500 grams of cleaned sample.
- All grading is done on representative portions divided down from the cleaned sample using a Boerner-type divider.

Hazardous substances in samples Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide or desiccant."

Representative portion for grading

All grading is done on representative portions divided down from the cleaned sample, using a Boerner-type divider.

When the grading factor is . . .	Then use . . .
Normal	Optimum portion size
Severe	Minimum portion size or more (do not use less)

Values in the table represent a range of recommended portions sizes.

Representative portion of safflower seed for grading, grams

Grading factor	Minimum	Optimum	Export
Damage	100	100	100
Dehulled	100	100	100
Empty hulls	100	250	250
Excreta	working sample	working sample	working sample
Heated	100	100	100
Matter other than cereal grains	100	250	250
Odour	working sample	working sample	working sample
Other grains	100	250	250
Rotted	100	100	100
Soft earth pellets	100	100	100
Stones	250	500	1000

Grading factors

Contaminated grain	<p>▲ Important: Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.</p> <p>Contaminated is defined in the “<i>Canada Grain Act</i>” as: “Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the <i>Food and Drugs Act</i>.”</p> <p>Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded <i>Safflower Seed, Sample Condemned</i>.</p>
Damage (DMGE)	<p>Damaged seeds are frosted, green, broken, heated, insect-damaged or otherwise unsound.</p> <p>Representative portion for analysis</p> <p>Minimum—100 g Optimum—100 g Export—100 g</p>
Dehulled (DHULL)	<p>Intact safflower seeds are called “achenes” which consists of the hull containing the seed. Dehulled seeds are broken or whole seeds without hulls.</p> <p>Representative portion for analysis</p> <p>Minimum—100 g Optimum—100 g Export—100 g</p>
Earth pellets (EP)	<ul style="list-style-type: none"> • Hard earth pellets are pellets that do not crumble under light pressure. See <i>Stones</i>. • Soft earth pellets are pellets that crumble under light pressure. See <i>Soft earth pellets</i>.
Empty hulls (HULLS)	<p>Intact safflower seeds are called “achenes” which consists of the hull containing the seed. Empty hulls are achenes with intact hulls but which contain no seeds. This also includes hulls having less than one-third of the seed attached.</p> <p>Representative portion for analysis</p> <p>Minimum—100 g Optimum—250 g Export—250 g</p>
Excreta (EXCR)	<p>▲ Important: Wear gloves and a mask to handle any samples that you suspect may contain excreta.</p> <p>Representative portion for analysis</p> <p>Minimum—working sample Optimum—working sample Export—working sample</p>

Fertilizer pellets (FERT PLTS) Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample
------------------------	------------------------	-----------------------

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Safflower Seed, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

Foreign material Foreign material in safflower seed includes other grains, sclerotinia, soft earth pellets and stones.

Heated (HTD) Heated seeds have the colour or odour typical of grain that has heated or deteriorated in storage. Heated kernels include kernels discoloured from artificial drying, but not charred kernels.

Representative portion for analysis

Minimum—100 g	Optimum—100 g	Export—100 g
---------------	---------------	--------------

Matter other than cereal grains (MOTCG) Matter other than cereal grains refers to weed seeds and other grains that are not readily removable and may include

- Peas, lentils, beans, corn, other domestic or wild seeds
- Ergot and sclerotinia sclerotiorum

Representative portion for analysis

Minimum—100 g	Optimum—250 g	Export—250 g
---------------	---------------	--------------

Odour (ODOR) There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

Representative portion for analysisMinimum—working
sampleOptimum—working
sampleExport—working
sample

If odour is the grade determinant and there is . . .	Then the grade is . . .
An excessive objectionable odour not associated with the quality of the grain, but not heated or fireburnt	<i>Safflower Seed, Sample Canada, Account Odour</i>
An excessive heated odour	<i>Safflower Seed, Sample Canada, Account Heated</i>
An excessive fireburnt odour	<i>Safflower Seed, Sample Canada, Account Fireburnt</i>

Other grains (OGRN)

Other grains in safflower seed include wheat, rye, triticale, barley, oats and groats, including wild oat groats, that remain in the cleaned sample.

Representative portion for analysis

Minimum—100 g

Optimum—250 g

Export—250 g

Rotted (ROT)

Seeds have the colour or odour typical of grain that has heated or deteriorated in storage. Rotted seed is considered in combination with heat-damaged kernels.

Representative portion for analysis

Minimum—100 g

Optimum—100 g

Export—100 g

Soft earth pellets (SEP)

Soft earth pellets are pellets that crumble under light pressure—if they do not crumble, they are considered stones. These pellets can be

- Earth and fertilizer pellets
- Any non-toxic material of similar consistency

Representative portion for analysis

Minimum—100 g

Optimum—100 g

Export—100 g

Soft earth pellets in safflower seed are considered as *Foreign material*.

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Representative portion for analysis

Minimum—250 g

Optimum—500 g

Export—1000 g

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
 2. Determine stone concentration in the net sample.
- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Safflower Seed, Rejected "basic grade" Account Stones*. The "basic grade" refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
 - In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Safflower Seed, Sample Canada Account Stones*.
 - In western and eastern Canada grain containing more than 2.5% stones is graded *Safflower Seed, Sample Salvage*.

Examples: Western Canada

Excerpt from grade determinant tables for
Safflower Seed, Canada

*Grade name	Stones
No. 1 Canada	3K
No. 2 Canada	3K
No. 3 Canada	3K

* Defined in the *Canada Grain Regulations*

K Number of kernel-sized pieces in 500 g

Basic grade:*Safflower Seed, No. 2 Canada*

Reason for basic grade:4.0% Dehulled

If the above sample contained	Grade in western Canada
6K stones	<i>Safflower Seed, Rejected No. 2 Canada Account Stones</i>
3.0% stones	<i>Safflower Seed, Sample Salvage</i>

Examples: Eastern Canada

Excerpt from grade determinant tables for
Safflower Seed, Canada

*Grade name	Stones
No. 1 Canada	3K
No. 2 Canada	3K
No. 3 Canada	3K

* Defined in the *Canada Grain Regulations*

K Number of kernel-sized pieces in 500 g

Basic grade: *Safflower Seed, No. 2 Canada*

Reason for basic grade: 4.0% Dehulled

If the above sample contained	Grade in eastern Canada
6K stones	<i>Safflower Seed, Sample Canada Account Stones</i>
3.0% stones	<i>Safflower Seed, Sample Salvage</i>

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals—pink or red, canola—baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Safflower Seed, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction “*Suspected Contaminated Grain, Handling Procedures*” for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Varieties	Safflower seed is graded without reference to variety.
------------------	--

Primary and export grade determinants tables

Safflower Seed, Canada (CAN)

*Grade name	Standard of quality	Damage		Foreign material			Hulls	
		*Heated %	*Total %	*Matter other than cereal grains %	Stones	*Total %	*Empty hulls %	*Dehulled seeds %
No. 1 Canada	*Degree of soundness Well matured, good natural colour	Nil	3.0	0.2	3K	0.5	0.5	2.0
No. 2 Canada	Reasonably well matured, may be moderately weather-stained	Nil	10.0	0.5	3K	2.0	1.0	5.0
No. 3 Canada	Excluded from higher grades on account of weather-stained, may have the odour associated with low-quality seed but not distinctly sour, musty or rancid	1.0	10.0	1.0	3K	5.0	2.0	8.0
Grade, if No. 3 specs not met		Safflower Seed, Sample Canada Account Heated	Safflower Seed, Sample Canada Account Damaged	Safflower Seed, Sample Canada Account Admixture	2.5% or less—Safflower Seed, Rejected (grade) Account Stones or Safflower Seed, Sample Canada, Account Stones Over 2.5%—Safflower Seed, Sample Salvage	Safflower Seed, Sample Canada Account Admixture	Safflower Seed, Sample Canada Account Hulls	Safflower Seed, Sample Canada Account Dehulled

* Defined in the *Canada Grain Regulations* Schedule III Table XIV

K Number of kernel-sized pieces in 500 g

Export shipments

Export shipments can be commercially clean or not commercially clean.

Commercially clean

Shipments defined as commercially clean may contain up to 2.5% by weight of dockage.

Dockage is reported to the nearest

- 0.1% for samples representing commercially clean shipments loaded from a single terminal or transfer elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal or transfer elevator

Not commercially clean (NCC)

Shipments that do not meet the standards for commercial cleanliness are referred to as not commercially clean. Such shipments are permitted only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal and transfer elevators, dockage is reported to the nearest 0.1%, less a deduction of up to 0.2%.

Grading

Safflower seed on export is graded in accordance with primary grade standards and specifications.

16. Peas

Determination of dockage	16-3
Definitions	16-3
Dockage not reported	16-3
Normal cleaning procedures	16-3
Composition of dockage	16-3
Determination of foreign material in field peas	16-4
Optional analysis	16-4
Sizing of yellow peas	16-5
Grading	16-6
Important definitions	16-6
Net weight of sample	16-6
Hazardous substances in samples	16-6
Representative portion sizes for grading	16-6
Grading factors	16-8
Binburnt	16-8
Bleached	16-8
Classes	16-8
Colour	16-8
Contaminated grain	16-9
Cracked seed coats	16-9
Damage	16-9
Earth pellets	16-10
Ergot	16-10
Excreta	16-10
Fertilizer pellets	16-10
Fireburnt	16-10
Foreign material	16-11
Heated	16-11
Inert material	16-11
Insect damage	16-11
Marsh spot	16-11
Odour	16-12
Other damage	16-12
Peas of other colours	16-12
Pulses other than green or yellow peas	16-12
Sclerotinia sclerotiorum	16-12
Shrivelled	16-13
Splits	16-13
Treated seed and other chemical substances	16-13
Variety	16-13

Primary and export grade determinants	16-14
Peas, Canada Green (CAN)	16-14
Peas, Canada, other than Green (CAN)	16-15
Peas, Canada Feed (CAN)	16-16
Export shipments	16-17

Determination of dockage

Definitions Dockage is assessed and recorded to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as “any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain.” Dockage is removed by following the cleaning procedures described in this section of the guide.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage not reported

- ▲ **Important:** Dockage is not reported for samples grading
- *Peas, Sample Canada* (colour or variety) *Account Fireburnt*
 - *Peas Sample Salvage*
 - *Peas, Sample Condemned*
 - *Feed Peas, Canada*

Normal cleaning procedures

- ▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.
1. Using a Boerner-type divider, divide the uncleaned sample to obtain two representative portions of approximately 250 g. Clean each portion individually.
 2. Sieve the sample over the slotted sieve that will achieve maximum removal of splits with minimum loss of whole peas. Use one of the following sieves:
 No. 8 slotted No. 9 slotted No. 11 slotted
 3. Determine dockage, using the list under *Composition of dockage*.

Composition of dockage

- All coarse foreign vegetable matter such as pods, stems, straw, and thistle tops handpicked from the sieved sample
- Split peas removed through sieving—record the percentage of splits in the dockage
- Other material removed through sieving

Determination of foreign material in feed peas

Foreign material in feed peas is defined as any material other than whole peas, broken peas or pea seed coats.

Representative portion for analysis

Minimum—100g

Optimum—250 g

Export—250 g

Procedures

1. Using a Boerner-type divider, divide the gross sample to obtain a representative portion.
2. Handpick the representative portion to remove all foreign material.

Note: Any approved sieve may be used to expedite the determination of foreign material, however only material other than peas, broken peas and pea seed coats is assessed as foreign material.

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal or transfer elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported and elevator stocks will be adjusted on the basis of the analysis. Agreement of the shipper and unload elevator must be conveyed to the CGC in writing prior to the analysis being performed.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
 - The percentage by gross weight to the nearest 0.1% and the grade of peas.
 - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
 - The percentage of dockage.

Example

95.0% Peas No. 1 CAN Yellow

4.0% Peas Sample CAN Yellow Account Splits

1.0% dockage

Sizing of yellow peas

In yellow peas only, size is part of the grade name.

1. Using a Boerner-type divider, divide a representative portion of 250 g.
2. Sieve the representative portion over the No. 14 round-hole sieve.
3. Determine the portion remaining on top of No. 14 round-hole sieve.

95% or more remains on top of No. 14 round-hole sieve	Less than 95% remains on top of No. 14 round-hole sieve		
The sample is designated <i>Large</i> .	1. Recombine the sample.		
	2. Sieve the sample over the No. 15 round-hole and No. 11 round-hole sieves.		
	3. Determine the portion passing through the No. 15 round-hole sieve.		
	90% or more passes through the No. 15 round-hole sieve		Less than 90% passes through
	Determine the amount that remains on top of the No. 11 round-hole sieve.		Graded without reference to size
	95% or more	Less than 95%	
	The sample is designated <i>Small</i> .	Graded without reference to size	

Grading

Important definitions

Net weight of sample The sample after cleaning and removal of dockage is called the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading of peas for human consumption refer to percentages of the cleaned sample, or the net weight.

Gross weight of sample The sample as it arrives is referred to as the uncleaned sample. Its weight is the gross weight of the sample.

Note: Percentages by weight for grading feed peas refer to percentages of the uncleaned sample, or the gross weight.

Hazardous substances in samples Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide or desiccant."

Representative portion sizes for grading

All grading of human consumption peas is done on representative portions divided down from the cleaned sample, using a Boerner-type divider.

All grading of feed peas is done on representative portions divided down from the gross sample, using a Boerner-type divider.

When the grading factor is . . .	Then use . . .
Normal	Optimum portion size
Severe	Minimum portion size or more (do not use less)

Values in the table represent a range of recommended portion sizes.

Representative portion of peas for grading, grams

Grading factor	Minimum	Optimum	Export
Binburnt	100	250	500
Bleached	50	100	100
Colour	working sample	working sample	working sample
Cracked seed coats	50	100	100
Damage	50	100	100
Ergot	250	500	1000
Excreta	working sample	working sample	working sample
Fireburnt	working sample	working sample	working sample
Foreign material	100	250	500
Heated	100	250	500
Inert material	working sample	working sample	working sample
Insect damage	50	100	100
Marsh spot	50	100	100
Odour	working sample	working sample	working sample
Other damage, marsh spot	50	100	100
Peas of other colours, classes	50	100	100
Shrivelled	50	100	100
Splits	50	100	100

Grading factors

Binburnt

Binburnt refers to peas that are blackened as a result of severe heating in storage. There is a single tolerance in feed peas for the total of heated and binburnt.

Representative portion for analysis

Minimum—100 g

Optimum—250 g

Export—500 g

Bleached (BLCH)

Bleached applies to green peas only. Bleached is not a grading factor in Vienna peas.

Green peas are considered bleached if one-eighth or more of the surface of the cotyledon is bleached to a distinct yellowish colour which is in marked contrast to its natural colour.

Representative portion for analysis

Minimum—50 g

Optimum—100 g

Export—100 g

Procedures

1. Examine a representative portion of the cleaned sample for any distinctly bleached or suspect bleached green peas.
2. Remove the seed coat from suspect seeds to determine the size of the bleached area on the cotyledons.

Classes

There are two classes of peas, green and other than green. The class forms part of the grade name. See *Peas of other colours*.

Colour (CLR)

Colour as a grade determinant is assessed after the removal of damaged peas and peas of other colours. Use standard colour charts or guides for picking out peas of other colours.

If peas are	Colour is . . .
A bright, normal colour	Good
Moderately immature, lightly ground-tagged or stained	Fair

If a sample of yellow peas contains ...	The sample is ...
Green peas	Considered damaged only if peas are damaged from another cause
Whole or split peas which are distinctly green throughout as a result of immaturity or variety	<i>Peas of other varieties</i>
Immature yellow peas	Considered damaged only if peas are damaged from another cause
Immature, but not distinctly green, peas	Not considered damaged, but taken into account in the general evaluation of the sample

Representative portion for analysisMinimum—working
sampleOptimum—working
sampleExport—working
sample**Contaminated grain**

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the “*Canada Grain Act*” as: “Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*.”

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Peas, Sample Condemned*.

Cracked seed coats (CSDC)

Cracked seed coats includes

- Peas with cracked seed coats—if the peas are otherwise damaged, they are included in the tolerance for damage, not cracked seed coats
- Peas with all or part of the seed coat removed
- Broken peas with less than one-fourth of the pea broken off—broken peas with more than one-fourth of the pea broken off are considered damaged

Representative portion for analysis

Minimum—50 g

Optimum—100 g

Export—100 g

Damage (DMG)

Damaged peas include

- Split or broken peas where more than one-fourth of the pea is broken off
- Whole peas that are sprouted, heated, shrivelled, damaged by insects, badly deteriorated or discoloured by weather or by disease, or that are otherwise damaged in a way that seriously affects their appearance or quality

Representative portion for analysis

Minimum—50 g

Optimum—100 g

Export—100 g

Earth pellets*See Foreign material.***Ergot
(ERG)**

Ergot is a plant disease producing elongated fungus bodies that have a purplish-black exterior, a purplish-white to off-white interior, and a relatively smooth surface texture.

Representative portion for analysis

Minimum—250 g

Optimum—500 g

Export—1000 g

**Excreta
(EXCR)**

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Representative portion for analysisMinimum—working
sampleOptimum—working
sampleExport—working
sample**Fertilizer
pellets
(FERT PLTS)**

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysisMinimum—working
sampleOptimum—working
sampleExport—working
sample**Procedures**

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Peas, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction “*Suspect Contaminated Grain, Handling Procedures*” for procedures to be followed when handling samples containing fertilizer pellets.

**Fireburnt
(FBNT)**

Fireburnt kernels have been charred or scorched by fire. No fireburnt kernels are allowed in peas, split peas or feed peas.

Representative portion for analysisMinimum—working
sampleOptimum—working
sampleExport—working
sample

Foreign material (FM)

Foreign material is not a grading factor in feed peas. Foreign material is any material other than peas or split peas.

Representative portion for analysis

Minimum—100 g

Optimum—250 g

Export—500 g

Heated (HTD)

Peas or split peas that have dull seed coats and discoloured cotyledons ranging from light tan to dark brown are considered heated.

Representative portion for analysis

Minimum—100 g

Optimum—250 g

Export—500 g

Procedures

1. Pick out heated peas by hand.
2. Cut the kernels to expose the cotyledon.

If peas are ...	Grading is ...
Lightly damaged, with tan-coloured meats and distinct heated odour	Heated
Otherwise	Damaged

Inert material

Inert material refers to mineral matter such as stones, coal shale and hard and soft earth pellets.

Representative portion for analysis

Minimum—working sample

Optimum—working sample

Export—working sample

Insect damage (I DMG)

Insect damage in peas or split peas refers to damage caused by insects such as weevils.

Representative portion for analysis

Minimum—50 g

Optimum—100 g

Export—100 g

Marsh spot

This nutritional disorder, caused by manganese deficiency in the soil, results in dark reddish brown spots or cavities on the inner surface of the cotyledons. Marsh spot is considered *Other damage* in peas.

Representative portion for analysis

Minimum—50 g

Optimum—100 g

Export—100 g

Procedure

Pearl the representative portion to split and expose the inner surface of the cotyledon.

**Odour
(ODOR)**

- There is no numeric tolerance for odour. Consider
- The basic quality of the sample
 - The type and degree of the odour
 - The presence of visible residue causing the odour

Representative portion for analysisMinimum—working
sampleOptimum—working
sampleExport—working
sample

If odour is the grade determinant and there is....	Then the grade is....
An excessive objectionable odour not associated with the quality of the grain, but not heated or fireburnt	<i>Peas, Sample Canada (colour and size) Account Odour</i>
An excessive heated odour	<i>Peas, Sample Canada (colour and size) Account Heated</i>
An excessive fireburnt odour	<i>Peas, Sample Canada (colour and size) Account Fireburnt</i>

**Other damage
(ODMG)**

- Other damage is
- Any damage other than splits, insect damage, heated or shrivelled
 - Any discolouration or physical damage on the face of the cotyledon

Representative portion for analysis

Minimum—50 g

Optimum—100 g

Export—100 g

**Peas of other
colours
(POOCLR)**

Colour is determined by the cotyledon colour and, in the case of Maple peas, seed coat colour. *Peas of other colours* includes any whole and split peas that are obviously of another colour or class.

Representative portion for analysis

Minimum—50 g

Optimum—100 g

Export—100 g

**Pulses other
than green or
yellow peas**

In feed peas, pulses other than green or yellow peas refers specifically to maple and marrowfat peas. These are not considered as part of foreign material. Other pulses such as beans, chick peas and lentils are included in foreign material.

**Sclerotinia
sclerotiorum
(SCL)**

See Foreign material.

Shriveled (SHV)	Shriveled peas are distinctly distorted and shrunken, or have a severely dimpled surface.		
Representative portion for analysis			
Minimum—50 g	Optimum—100 g	Export—100 g	
Splits (SPLTS)	Splits include split peas, split peas of other colours, broken pieces that are less than three-quarters of the whole seed, and cotyledons that are loosely held together by the seed coat.		
Representative portion for analysis			
Minimum—50 g	Optimum—100 g	Export—100 g	
Treated seed and other chemical substances	Treated seed Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals—pink or red, canola—baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.		
	Other chemical substances Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.		
	▲ Important: Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.		
	Representative portion for analysis		
Minimum—working sample	Optimum—working sample	Export—working sample	
	If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded <i>Peas, Held IP Suspect Contaminated Grain</i> .		
	Note: Canadian Grain Commission personnel should refer to ISO national work instruction “ <i>Suspected Contaminated Grain, Handling Procedures</i> ” for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.		
Variety	On written request, the variety is shown as part of the grade name, for example, <i>Peas, No. 2 Canada, Maple</i> . “Varietal purity not guaranteed” is shown in the Remarks section of certificate issued using a varietal name.		

Primary and export grade determinants tables

Peas, Canada Green (CAN)

*Grade name	Standard of quality	Other classes and bleached				Foreign material			
		*Other classes %	*Bleached %	*Total %	Ergot %	Excreta %	*Total %		
No. 1 Canada	Good natural colour	0.5	2.0	2.0	0.05	0.01	0.1		
No. 2 Canada	Fair colour	1.0	3.0	3.8	0.05	0.01	0.2		
No. 3 Canada	Off-colour	2.0	5.0	6.5	0.05	0.01	0.5		
Grade, if No. 3 specs not met		10.0% or less— Peas, Sample Canada (Green or variety) Account or variety) Account Mixed Colours Over 10.0%— Peas, Sample Canada Account Mixed Colours	Peas, Sample Canada (Green or variety) Account Bleached	Peas, Sample Canada (Green or variety) Account Mixed Colours and Bleached	Peas, Sample Canada (Green or variety) Account Ergot	Peas, Sample Canada (Green or variety), Account Excreta	Peas, Sample Canada (Green or variety) Account Admixture		

*Grade name	*Cracked seed coats including splits %	Damage						*Total %
		*Heated %	*Insect damage %	*Other damage %	*Shrivelled %	*Splits %		
No. 1 Canada	5.0	Nil	0.3	2.0	2.0	0.5	3.0	
No. 2 Canada	8.0	0.1	0.8	4.0	4.0	1.0	5.0	
No. 3 Canada	13.0	0.5	2.5	10.0	8.0	5.0	12.0	
Grade, if No. 3 specs not met	Peas, Sample Canada (Green or variety) Account Cracked Seed Coats	Peas, Sample Canada (Green or variety) Account Heated	Peas, Sample Canada (Green or variety) Account Insect Damage	Peas, Sample Canada (Green or variety) Account Damage	Peas, Sample Canada (Green or variety) Account Shrivelled	Peas, Sample Canada (Green or variety) Account Splits	Peas, Sample Canada (Green or variety) Account Damage	

* Defined in the *Canada Grain Regulations* Schedule III Table XX1

Note: The variety or colour is added to the grade name.

Peas, Canada, other than Green (CAN)

*Grade name	Standard of quality		*Other colours %	Foreign material		
	*Colour			Ergot %	Excreta %	*Total %
No. 1 Canada	Good natural colour		1.0	0.05	0.01	Trace
No. 2 Canada	Fair colour		2.0	0.05	0.01	0.5
Extra No. 3 Canada	Fair colour		2.0	0.05	0.01	0.5
No. 3 Canada	Off-colour		3.0	0.05	0.01	1.0
Grade, if No. 3 specs not met			Peas, Sample Canada (Yellow or variety) Account Mixed Colours	Peas, Sample Canada (Yellow or variety) Account Ergot	Peas, Sample Canada (Yellow or variety) Account Excreta	Peas, Sample Canada (Yellow or variety) Account Admixture

*Grade name	*Cracked seed coats including splits %	Damage					
		*Heated %	*Insect damage %	Other damage %	*Shrivelled %	*Splits %	*Total %
No. 1 Canada	5.0	Nil	1.0	3.0	3.0	1.0	3.0
No. 2 Canada	9.5	0.05	1.5	5.0	5.0	2.5	5.0
Extra No. 3 Canada	13.0	0.05	1.5	5.0	5.0	5.0	8.5
No. 3 Canada	15.0	0.2	4.0	10.0	7.0	5.0	10.0
Grade, if No. 3 specs not met	Peas, Sample Canada (Yellow or variety) Account Cracked Seed Coats	Peas, Sample Canada (Yellow or variety) Account Heated	Peas, Sample Canada (Yellow or variety) Account Insect Damage	Peas, Sample Canada (Yellow or variety) Account Damage	Peas, Sample Canada (Yellow or variety) Account Shrivelled	Peas, Sample Canada (Yellow or variety) Account Splits Over 5.0% and over 3.0% other colours—Peas Sample Canada Account Mixed Colours and Splits	Peas, Sample Canada (Yellow or variety) Account Damage

* Defined in the *Canada Grain Regulations* Schedule III Table XX.

Note: The variety or colour is added to the grade name.

Peas, Canada Feed (CAN)

*Grade name	*Fireburnt %	*Heated and binburnt %	*Pulses other than green and yellow peas %	*Inert material %	*Ergot %	*Excreta %
Canada Feed Peas	nil	1.0	5.0	1.0	0.05	0.02
Grade, if Feed peas specs not met	Feed Peas, Sample Canada Account Fireburnt Kernels	Feed Peas, Sample Canada Account Heated	Feed Peas, Sample Canada Account Pulses Other than Green and Yellow Peas	Feed Peas, Sample Canada Account Inert Material	Feed Peas, Sample Canada Account Ergot	Feed Peas, Sample Canada Account Excreta

* Defined in the *Canada Grain Regulations* Schedule III Table XXI.1

Export shipments

Peas on export are graded in accordance with primary grade standards and specifications. Foreign material in cleaned or processed peas is treated as a grading factor and not assessed as dockage. Cargoes containing dockage may not be shipped except with permission from the CGC.

17. Corn

Determination of dockage	17-2
Definitions	17-2
Dockage not reported	17-2
Normal cleaning procedures: Carter dockage tester	17-2
Normal cleaning procedures: manual procedures	17-3
Composition of dockage	17-3
Optional analysis	17-3
Estimating test weight of well-matured corn after drying	17-4
Grading	17-5
Important definitions	17-5
Net weight of sample	17-5
Kernel counts	17-5
Hazardous substances in samples	17-5
Representative portions for grading	17-5
Grading factors	17-6
Blue-eye mould	17-6
Caramelized kernels	17-6
Classes	17-6
Contaminated grain	17-6
Cracked corn and foreign material	17-7
Damage	17-7
Earth pellets	17-7
Excreta	17-7
Fertilizer pellets	17-8
Fireburnt	17-8
Foreign material	17-8
Heated	17-8
Odour	17-9
Rotted	17-9
Stones	17-9
Treated seed and other chemical substances	17-11
Varieties	17-12
Primary and export grade determinants	17-13
Corn, Canada Western/Canada Eastern	
Yellow, White or Mixed (CW/CE)	17-13
Export shipments	17-14
Grading	17-14
Cracked corn and foreign material	17-14

Determination of dockage

Definitions

Dockage is only assessed when producers deliver corn to country elevators in eastern Canada. Dockage is assessed to the nearest 0.1%. In all other locations, this material is called *Cracked corn and foreign material (CCFM)* and is a grading factor.

Dockage is defined under the Canada Grain Act as "any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain." Dockage is removed by following the cleaning procedures described in this section of the manual.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage not reported

▲ **Important:** Dockage is not reported when corn is graded

- *Corn, Sample CW/CE Account Fireburnt*
- *Corn, Sample Salvage*
- *Corn, Sample Condemned*

Normal cleaning procedures: Carter dockage tester

▲ **Important:** Wear gloves and a mask to handle any sample which you suspect may contain hazardous substances.

Assess dockage before assessing test weight.

1. Set up the Carter dockage tester as follows:

Feed control	# 10
Air control	off
Riddle	none
Top sieve	No. 12 round-hole (moisture 25.0% or less) No. 14 round-hole (moisture over 25.0%)
Centre sieve	blank tray
Bottom sieve	none
Sieve cleaner	off

2. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
 - Official samples should be at least 900 g.
 - Unofficial samples should be at least 750 g.
3. Turn on the Carter dockage tester.
4. Pour the sample into the hopper.

5. After the sample has passed through the machine, turn off the Carter dockage tester.
6. Remove the sample pans containing the corn and broken corn.
7. Determine dockage, using the list under *Composition of dockage*.

**Normal
cleaning
procedures:
manual
procedures**

Manual procedures for normal cleaning of corn require

- No. 12 round-hole sieve for corn with 25% moisture or less
- No. 14 round-hole sieve for corn over 25% moisture

1. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
 - Official samples should be at least 900 g.
 - Unofficial samples should be at least 750 g.
2. Sieve approximately 250 g at a time on the appropriate hand sieve until you feel that all possible material has fallen through the sieve.
3. Handpick material remaining on top of the sieve as described under *Composition of dockage*.

**Composition
of dockage**

- All material which passes through the No. 12 or No. 14 round-hole sieve
- All foreign material and pieces of cob handpicked from the sample, excluding stones

**Optional
analysis**

Where a shipper requests special cleaning of a carlot of grain at a terminal or transfer elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported and elevator stocks will be adjusted on the basis of the analysis. Agreement of the shipper and unload elevator must be conveyed to the CGC in writing prior to the analysis being performed.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
 - The percentage by gross weight to the nearest 0.1% and the grade of corn.
 - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
 - The percentage of dockage.

Example

95.0% Corn, No. 1 CW

4.0% Domestic Mustard Seed, No. 1 CAN Oriental

1.0% dockage

Estimating test weight of well-matured corn after drying

Note: Test weight is determined on corn prior to removal of cracked corn and foreign material. At country elevators in eastern Canada test weight is determined after the removal of dockage.

Corn samples that contain a high percentage of moisture typically show an increase in test weight after drying. Use the following table to predict the test weight of well-matured corn before drying.

▲ **Important:** This is only a guide, and works only with well matured corn. Samples should be checked yearly to ensure that the formula applies for that crop condition.

Moisture range	Amount to add	
	kg/hL	g/0.5 L
15.8 - 16.4	0.5	2.6
16.5 - 16.9	1.0	5.2
17.0 - 17.3	2.0	10.5
17.4 - 17.6	2.1	11.0
17.7 - 17.9	2.2	11.5
18.0 - 18.3	2.3	12.0
18.4 - 18.6	2.4	12.5
18.7 - 18.9	2.5	13.0

1. Find the moisture range for the test weight of the sample.
2. Add the amount for that moisture range in the appropriate units, either kg/hL or g/l.

▲ **Important:** Corn samples are not to be downgraded on the basis of an "estimated" test weight. Questionable samples must be dried by exposure and then have the test weight determined.

For example,

The moisture for the tested sample is 17.5%, and the test weight is in kg/hL.

Moisture range	Amount to add	
	kg/hL	g/0.5 L
17.4 - 17.6	2.1	11.0

Add 2.1 to the test weight in kg/hL.

Grading

Important definitions

Net weight of sample The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the net weight.

Kernel counts (K) A kernel count is the number of kernel-sized pieces of stones in a sample of corn.

- To do kernel counts, you must have 500 grams of cleaned sample.
- All grading is done on representative portions divided down from the cleaned sample using a Boemer-type divider.

Hazardous substances in samples Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as “any pesticide, herbicide or desiccant.”

Representative portions for grading

All grading is done on representative portions divided down from the cleaned sample, using a Boemer-type divider.

When the grading factor is . . .	Then use . . .
Normal	Optimum portion size
Severe	Minimum portion size or more (do not use less)

Values in this table represent a range of recommended portion sizes.

Representative portion of corn for grading, grams

Grading factor	Minimum	Optimum	Export
Caramelized kernels	100	500	500
Classes	100	working sample	working sample
Cracked corn and foreign material	working sample	working sample	working sample
Damage	100	500	500
Excreta	working sample	working sample	working sample
Fireburnt	working sample	working sample	working sample
Heated and rotted	100	500	working sample
Odour	working sample	working sample	working sample
Stones	500	working sample	working sample

Grading factors

Blue-eye mould

Germ of kernels appear dark blue with mould, or there may be just a visible mouldy blue streak under the hull of the germ. In the second case, peel back the hull from the germ to examine the germ.

Blue-eye mould is included in the tolerance for *Damage*.

Representative portion for analysis

Minimum—100 g

Optimum—500 g

Export—500 g

Caramelized kernels

Caramelized kernels are kernels that were very immature when dried at a high temperature in a dryer, and the heat has turned the kernel to a scorched colour similar to that of heated kernels. The outer hull of the kernel may be peeled off showing a slightly damaged kernel inside. These kernels are classed as *Damaged*.

Representative portion for analysis

Minimum—100 g

Optimum—500 g

Export—500 g

Classes

Corn is classed as yellow, white, or mixed. The class forms part of the grade name; for example, *Corn, Sample CW Yellow Account Heated*.

Samples of yellow and white corn containing less than 95.0% of one class are designated *Mixed*; for example, *Corn No. 1 CE Mixed*.

Representative portion for analysis

Minimum—100 g

Optimum—working
sampleExport—working
sample**Contaminated grain**

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the “*Canada Grain Act*” as; “Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*.”

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Corn, Sample Condemned*.

Cracked corn and foreign material (CCFM)

Cracked corn and foreign material includes any of the following:

- All material including kernels and pieces of kernels of corn or any other grains which pass through a No. 12 round-hole sieve or, for samples with a moisture level over 25.0%, through the No. 14 round-hole sieve
- All foreign material other than stones handpicked from the sample, including pieces of cobs that were not removed by sieving

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

Procedures

▲ **Important:** Follow procedures for assessing dockage.

Damage (DMG)

Damaged kernels include whole kernels or pieces of kernels which are

- Affected by blue-eye mould and other types of moulds
- Sprouted
- Ground-damaged
- Weathered
- Diseased
- Frosted
- Scorched, from a drier
- Heated, naturally, or from a drier, or caramelized
- Rotted

Representative portion for analysis

Minimum—100 g

Optimum—500 g

Export—500 g

Earth pellets

- Hard earth pellets are pellets that do not crumble under light pressure.
See *Stones*.
- Soft earth pellets are pellets that crumble under light pressure.
See *Cracked corn and foreign material*.

Excreta (EXCR)

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

Procedures

Samples of corn containing excreta are graded on a comparable basis using tolerances established for excreta in other grains.

**Fertilizer pellets
(FERT PLTS)**

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Corn, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction “*Suspect Contaminated Grain, Handling Procedures*” for procedures to be followed when handling samples containing fertilizer pellets.

**Fireburnt
(FBNT)**

Fireburnt kernels are kernels charred or scorched by fire. A cross-section of a fireburnt kernel resembles charcoal with numerous air holes. The air holes result in a low weight kernel which crumbles easily under pressure.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

Procedures

Samples of corn containing fireburnt kernels are graded *Corn, Sample CW/CE (class) Account /Fireburnt*.

**Foreign material
(FM)**

See *Cracked corn and foreign material (CCFM)*.

**Heated
(HTD)**

Heated kernels have at least one of the following characteristics:

- Whole kernels or pieces of kernels which range in colour from amber to dark brown over the entire kernel
- Kernels which are totally discoloured by fermentation and show no natural colour on the crowns or dorsals, or both
- The germ of the kernel is amber to dark brown and is severely puffed in the germ area when heated in a drier
- A kernel of any other grain that is heated

If kernels exhibit none of the above characteristics, but are not whole or sound, they are classed as *Damaged*.

Note: Cracked corn and foreign material that is heated is included with heated corn for grade assessment.

Representative portion for analysis

Minimum—100 g

Optimum—500 g

Export—500 g

**Odour
(ODOR)**

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

Grains grading No. 1 through 4 must be cool and sweet. Corn grading No. 5 may have a slight odour associated with the low quality, but the odour cannot be sour or musty.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

If odour is the grade determinant and there is . . .	Then the grade is . . .
An excessive objectionable odour not associated with the quality of the grain, but not heated or fireburnt	<i>Corn, Sample CW/CE Account Odour</i>
An excessive heated odour	<i>Corn, Sample CW/CE Account Heated</i>
An excessive fireburnt odour	<i>Corn, Sample CW/CE Account Fireburnt</i>

**Rotted
(ROT)**

Rotted kernels are whole kernels or pieces of kernels which are visibly in advanced stages of decomposition and feel spongy under pressure. Rotted kernels are included in the percentage of heated kernels for grade assessment.

Representative portion for analysis

Minimum—100 g

Optimum—500 g

Export—500 g

**Stones
(STNS)**

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Representative portion for analysis

Minimum—500 g

Optimum—1000 g

Export—1000 g

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
 2. Determine stone concentration in the net sample.
- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Corn, Rejected "basic grade" Account Stones*. The "basic grade" refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
 - In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Corn, Sample Canada Account Stones*.
 - In western and eastern Canada grain containing more than 2.5% stones is graded *Corn, Sample Salvage*.

Examples: Western Canada

Excerpt from grade determinant tables for
Corn, Canada Western, White, Yellow or Mixed

*Grade name	Stones
No. 1 CW	3K
No. 2 CW	3K
No. 3 CW	3K
No. 4 CW	3K
No. 5 CW	3K

* Defined in the *Canada Grain Regulations*

K Number of kernel-sized pieces in 500 g

Basic grade: *Corn, No. 2 CW Yellow*

Reason for basic grade: 3.0% Cracked corn and foreign material

If the above sample contained	Grade in Western Canada
10K stones	<i>Corn, Rejected No. 2 CW Yellow Account Stones</i>
3.0% stones	<i>Corn, Sample Salvage</i>

Examples: Eastern Canada

Excerpt from grade determinants table for
Corn, Canada Eastern, White, Yellow or Mixed

*Grade name	Stones
No. 1 CE	3K
No. 2 CE	3K
No. 3 CE	3K
No. 4 CE	3K
No. 5 CE	3K

* Defined in the *Canada Grain Regulations*

K Number of kernel-sized pieces in 500 g

Basic grade: *Corn, No. 2 CE Yellow*

Reason for basic grade: 3.0% Cracked corn and foreign material

If the above sample contained	Grade in Western Canada
10K stones	<i>Corn, Sample CE Yellow Account Stones</i>
3.0% stones	<i>Corn, Sample Salvage</i>

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals—pink or red, canola—baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Corn, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction “*Suspected Contaminated Grain, Handling Procedures*” for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Varieties	Corn is graded without reference to variety.
------------------	--

Primary and export grade determinants table

Corn, Canada Western/Canada Eastern Yellow, White or Mixed (CW/CE)

*Grade name	Standard of quality		Damage		Stones	*Cracked corn and foreign material %	Other classes %
	*Minimum test weight kg/hL (g/0.5 L)	*Degree of soundness	*Heated %	*Total %			
No. 1 CW/CE	68.0 (344)	Cool and sweet, uniform size	0.1	3.0	3K	2.0	5.0
No. 2 CW/CE	66.0 (333)	Cool and sweet	0.2	5.0	3K	3.0	5.0
No. 3 CW/CE	64.0 (322)	Cool and sweet	0.5	7.0	3K	5.0	5.0
No. 4 CW/CE	62.0 (311)	Cool and sweet	1.0	10.0	3K	7.0	5.0
No. 5 CW/CE	58.0 (290)	May have a slight odour, not sour or musty	3.0	15.0	3K	12.0	5.0
Grade, if No. 5 specs not met	Corn, Sample CW/CE (class) Account Light Weight		Corn, Sample CW/CE (class) Account Heated	Corn, Sample CW/CE (class) Account Damaged	2.5% or less—Corn, Rejected (grade) (class) Account Stones or Corn, Sample CE (class) Account Stones Over 2.5%—Corn, Sample Salvage	50.0% or less—Corn Sample CW/CE (class) Account CCFM Over 50.0%—Sample Cracked Corn and Foreign Material	Over 5.0%—Use all other grading criteria and grade as Corn (grade) Mixed

* Defined in the Canada Grain Regulations Schedule III Table XIII and Table XII

K Number of kernel-sized pieces in 500 g

Note: The colour is added to the grade name.

Export shipments

Grading

Corn on export is graded in accordance with primary grade standards and specifications.

Cracked corn and foreign material (CCFM)

Because breakage occurs during handling at terminal and transfer elevators, round down percentages by weight of CCFM to the nearest whole number only on officially sampled and inspected shipments from a transfer or terminal elevator.

For example, a sample containing 4.7% CCFM by weight is recorded as containing 4.0% CCFM for grading purposes only on officially sampled and inspected shipments from a transfer or terminal elevator.

18. Lentils

Determination of size (sizing)	18-3
Determination of dockage	18-4
Definitions	18-4
Dockage not reported for	18-4
Normal cleaning procedures	18-4
Composition of dockage	18-5
Cleaning for grade improvement	18-5
Optional analysis	18-5
Grading	18-6
Important definitions	18-6
Net weight of sample	18-6
Hazardous substances in sample	18-6
Representative portions for grading	18-6
Grading factors	18-8
Ascochyta	18-8
Broken	18-8
Colour	18-8
Contaminated grain	18-8
Contrasting colours	18-9
Damage	18-9
Earth pellets	18-9
Ergot	18-9
Excreta	18-9
Fertilizer pellets	18-9
Fireburnt	18-10
Foreign material	18-10
Frost damage	18-10
Heated	18-11
Odour	18-11
Peeled, split and broken	18-11
Rime	18-12
Sclerotinia sclerotiorum	18-12
Split	18-12
Sprouted	18-12
Stained	18-12
Stones	18-13
Treated seed and other chemical substances	18-15
Variety	18-15
Primary grade determinants tables	18-16
Lentils, Canada, other than Red (CAN)	18-16
Lentils, Canada Red (CAN)	18-17

18. Lentils

Export shipments	18-18
Commercially clean	18-18
Not commercially clean	18-18
Processed shipments	18-18
Grading	18-15
Export grade determinants tables	18-19
Lentils, Canada (CAN)	18-19

Determination of size (sizing)

On written request, processed lentils are designated as large or small.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

1. Set up the Carter dockage tester as follows:

Feed control	#6
Air control	Off
Riddle	None
Top sieve	No. 15 round-hole
Centre sieve	No. 12 round-hole
Bottom sieve	Blank tray
Sieve cleaner control	Off

2. Using a Boerner-type divider, divide the cleaned sample to obtain a representative portion of 250 g.
3. Turn on the Carter dockage tester.
4. Pour the sample into the hopper.
5. After the sample has passed through the machine, turn off the dockage tester.
6. Weigh separately. The percentage by weight determines the size of the lentils in the sample.

If ...	Then the size is ...
97% or more of the sample remains on top of a No. 15 round-hole sieve	<i>Large, for example, Lentils, No. 1 CAN</i>
80% or more passes through the No. 12 round-hole sieve	<i>Small, for example, Lentils, No. 1 CAN</i>
otherwise	no size indicated

Determination of dockage

Definitions

Dockage is assessed and recorded to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as "any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain." Dockage is removed by following the cleaning procedures described in this section of the guide.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage is assessed in two stages.

1. Follow *Normal cleaning procedures*, using the Carter dockage tester.
2. Follow procedures for *Cleaning for grade improvement*. This cleaning can be done at any time after normal cleaning has been completed.

Dockage not reported

- ▲ **Important:** Dockage is not reported for samples grading
 - *Lentils, Sample Canada Account Fireburnt*
 - *Lentils, Sample Salvage*
 - *Lentils, Sample Condemned*

Normal cleaning procedures

- ▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

1. Set up the Carter dockage tester as follows:

Setting	Small	Other
Feed control	#5	#6
Air control	#7	#7
Riddle	No. 1	No. 6
Top sieve	No. 9 round-hole	No. 12 round-hole
Centre sieve	blank tray	blank tray
Bottom sieve	none	none
Sieve cleaner control	Off	Off

2. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
 - Official samples should be at least 900 grams.
 - Unofficial samples should be at least 750 grams.

3. Turn on the Carter dockage tester.
4. Pour the sample into the hopper.
5. Turn off the dockage tester.
6. Lightly snap the retainer rod of the aspiration pan to loosen material gathered on the air screen.
7. Remove the aspiration pan.
8. Determine dockage using the list under *Composition of dockage*.

Composition of dockage

- Material other than whole lentils that remain on top of the riddle—whole sound lentils are returned to the sample
- Material which passes through the selected round hole sieve
- Material remain on top of the aspiration pan
- Material removed by special cleaning for grade improvement procedures if the grade can be improved

Cleaning for grade improvement

If the grade of a sample can be improved by additional cleaning, perform the cleaning and add the additional material to dockage. Cleaning for grade improvement can be done at any time after normal cleaning.

1. Sieve the sample by hand using the appropriate hand sieve.

▲ **Important:** When you use a hand sieve, move the sieve from left to right 30 times, using a sifting motion. One time is one complete motion from the centre, to one side, to the other side, and back to the centre. The total distance from left to right is 20 cm.

2. Weigh the additional dockage and add it to the original dockage.

Size of lentil	Equipment	Effect on composition of dockage
Small	No. 9x9 wire hand sieve No. 10 round-hole hand sieve	Material removed by the sieve is added to dockage, other than whole sound lentils
Large	No. 9x9 wire hand sieve	Material removed by the sieve is added to dockage, other than whole sound lentils

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal or transfer elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported and elevator stocks will be adjusted on the basis of the analysis. Agreement of the shipper and unload elevator must be conveyed to the CGC in writing prior to the analysis being performed.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
 - The percentage by gross weight to the nearest 0.1% and the grade of lentils.
 - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
 - The percentage of dockage.

Example

95.0% Lentils, No. 1 CAN

4.0% Domestic Mustard Seed, No. 1 CAN Oriental

1.0% dockage

Grading

Important definitions

Net weight of sample The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the cleaned sample, or the net weight.

Hazardous substances in samples Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as “any pesticide, herbicide or desiccant.”

Representative portions for grading

All grading is done on representative portions divided down from the cleaned sample, using a Boerner-type divider.

When the grading factor is . . .	Then use . . .
Normal	Optimum portion size
Severe	Minimum portion size or more (do not use less)

Values in this table represent a range of recommended portion sizes.

Representative portion of lentils for grading, grams

Grading factor	Minimum	Optimum	Export
Ascochyta	25	100	100
Contrasting colours	50	100	250
Damage	25	50	100
Ergot	500	working sample	working sample
Excreta	working sample	working sample	working sample
Fireburnt	500	working sample	working sample
Foreign material	50	100	250
Heated	50	100	100
Odour	working sample	working sample	working sample
Peeled, split and broken	25	100	100
Sclerotinia sclerotiorum	250	500	500
Stained	25	50	50
Stones	250	working sample	working sample

Grading factors

Ascochyta

Ascochyta is a fungal disease that attacks the lentil plant and seed. Any degree of white fungal growth on the seed is considered damaged. See *Damage*.

Representative portion for analysis

Minimum—25 g

Optimum—100 g

Export—100 g

Broken

See *Peeled, split and broken*.

Colour (CLR)

Colour is evaluated after the removal of stained and damaged lentils, using approved lentil colour guides.

Description used in grade determinants table	Characteristics
Good natural colour	Lentils that are sound, well matured and have a good natural colour.
Reasonably good natural colour	Lentils that are moderately immature, with light amounts of adhered soil or lightly discoloured from storage or other natural causes.
Fair colour	Lentils that are immature but not green, moderate amounts of adhered soil, or otherwise moderately discoloured from natural causes.
Poor colour	Lentils that do not meet the definition of fair colour, but are without severely adhered soil or are severely discoloured (dark brown).

The term sunburned or oxidation is used to describe the normal discolouration of the seed coat which occurs during storage. The colour may vary from light tan to brown or very dark brown, depending on the duration and conditions of storage.

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the “*Canada Grain Act*” as: “Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*.”

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Lentils, Sample Condemned*.

Contrasting colours	<p>Contrasting colours refers to cotyledon colour and significantly different seed coat colour.</p> <ul style="list-style-type: none"> • Cotyledons: red cotyledons contrast with yellow cotyledons • Seed coats: dark-green speckled lentils contrast with green lentils
Damage (DMG)	<p>Damaged lentils may be peeled, split, broken, sprouted, distinctly green, frost damaged, distinctly deteriorated or discoloured by weather or disease, insect damaged, heat damaged or otherwise damaged in a way which materially affects quality.</p> <p>▲ Important: Kernels that are deformed are considered sound unless there is another reason for the damage beyond the deformity.</p> <p>Representative portion for analysis</p> <p>Minimum—25 g Optimum—50 g Export—100 g</p>
Earth pellets (EP)	<ul style="list-style-type: none"> • Hard earth pellets are pellets that do not crumble under light pressure. See <i>Stones</i>. • Soft earth pellets are pellets that crumble under light pressure. See <i>Foreign material</i>.
Ergot (ERG)	<p>Ergot is a plant disease producing elongated fungus bodies with a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.</p> <p>Representative portion for analysis</p> <p>Minimum—500 g Optimum—working sample Export—working sample</p>
Excreta (EXCR)	<p>▲ Important: Wear gloves and a mask to handle any samples that you suspect may contain excreta.</p> <p>Representative portion for analysis</p> <p>Minimum—working sample Optimum—working sample Export—working sample</p>
Fertilizer pellets (FERT PLTS)	<p>Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.</p> <p>Representative portion for analysis</p> <p>Minimum—working sample Optimum—working sample Export—working sample</p>

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Lentils, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

Fireburnt (FBNT)

Fireburnt seeds are seeds charred or scorched by fire. A cross-section of a fireburnt seed resembles charcoal with numerous air holes. The air holes result in a low weight seed which crumbles easily under pressure.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

Procedure

Samples of lentil containing any fireburnt seeds are graded *Lentil, Sample Canada Account Fireburnt*.

Foreign material (FM)

Foreign material includes anything that is not a lentil or part of a lentil.

Representative portion for analysis

Minimum—50 g

Optimum—100 g

Export—250 g

Frost damage (FR)

Frost damage is normally indicated by a combination of wrinkling and close adherence of the seed coat to the cotyledon. The seed coat may be translucent in appearance, and the cotyledons are brittle in texture. Frost damage is included in the tolerance for *Damage*.

Representative portion for analysis

Minimum—25 g

Optimum—50 g

Export—100 g

Procedures

1. Handpick all frost-damaged lentils.
2. Cut suspect frost-damaged lentils. Frost-damaged seeds are brittle when cut.

**Heated
(HTD)**

Heated lentils are usually dark tan to black in appearance.

If sample contains ...	Then the grading factor is ...
Lentils with tan-coloured cotyledons and a distinct heated odour	<i>Heated</i>
Lentils with tan-coloured cotyledons and no odour	<i>Damage</i>

Representative portion for analysis

Minimum—50 g

Optimum—100 g

Export—100 g

Procedures

1. Handpick suspect heated lentils.
2. Cut suspect seeds to expose the cotyledons. Heated lentils have tan-coloured cotyledons.

**Odour
(ODOR)**

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

Representative portion for analysisMinimum—working
sampleOptimum—working
sampleExport—working
sample

If odour is the grade determinant and there is ...	Then the grade is ...
An excessive objectionable odour not associated with the quality of the grain, but not heated or fireburnt	<i>Lentils, Sample Canada Account Odour</i>
An excessive heated odour	<i>Lentils, Sample Canada Account Heated</i>
An excessive fireburnt odour	<i>Lentils, Sample Canada Account Fireburnt</i>

**Peeled, split
and broken
(PLDSPLTBKN)**

Peeled, split and broken includes lentils which are otherwise sound but which are less than three-quarters of whole seeds or where less than one-half of the seed coat is intact.

Lentils with cracked or clipped seed coats are considered sound when the cotyledons are firmly held together.

Representative portion for analysis

Minimum—25 g

Optimum—100 g

Export—100 g

**Rime
(RIME)**

Rime is the adhered lining of the seed pod. It is included in the general tolerance for *Damage*.

If the rime ...	Then the grading is ...
Completely and densely covers the lentils	<i>Damaged</i>
Is sparse enough to expose the soundness of the lentil	<i>Sound</i> —the rime is considered in the general appearance of the sample

Representative portion for analysis

Minimum—25 g

Optimum—50 g

Export—100 g

**Sclerotinia
sclerotiorum
(SCL)**

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, and have a dark black exterior, a pure white interior and a coarse surface texture.

Representative portion for analysis

Minimum—250 g

Optimum—500 g

Export—500 g

Split

See *Peeled, split and broken*.

**Sprouted
(SPTD)**

Lentils are considered sprouted when the seed coat splits and the primary root emerges from between the cotyledons. Sprouted is considered in the total tolerance for *Damage*.

Representative portion for analysis

Minimum—25 g

Optimum—50 g

Export—100 g

**Stained
(STND)**

Stained lentils includes

- Mottled seeds—seeds with a significant number of distinct spots on the seed coat
- Water spot—seeds with distinct brown discolourations on the seed coat
- Ascochyta—seeds with dark-coloured lesions on the seed coat. Seeds with white fungal growth are also considered as damaged. See *Ascochyta*.
- Blue-black—seeds of green lentils with significant blue-black discolouration of the seed coat. Seeds of varieties of lentils with dark-green speckled or coloured seed coats are considered as *Contrasting colours*.

Representative portion for analysis

Minimum—25 g

Optimum—50 g

Export—50 g

Procedure

Refer to digitally produced colour prints of stained lentils as a grading guide

**Stones
(STNS)**

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Representative portion for analysis

Minimum—250 g

Optimum—working
sampleExport—working
sample**Procedures**

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.
 - In western Canada samples of grain containing stones in excess of “basic grade” tolerances, up to 2.5% are graded *Lentils, Rejected “basic grade” Account Stones*. The “basic grade” refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
 - In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Lentils, Sample Canada Account Stones*.
 - In western and eastern Canada grain containing more than 2.5% stones is graded *Lentils, Sample Salvage*.

Examples: Western Canada

Excerpt from grade determinant tables for
Lentils, Canada Red

*Grade name	Stones %
No. 1 Canada Red	0.1
No. 2 Canada Red	0.2
Extra No. 3 Canada Red	0.2
No. 3 Canada Red	0.2

*Defined in the *Canada Grain Regulations*

Basic grade:*Lentils, No. 1 Canada Red*

If the above sample contained	Grade in western Canada
0.2% stones	<i>Lentils, Rejected No. 1 Canada Red Account Stones</i>
1.0% stones	<i>Lentils, Rejected No. 1 Canada Red Account Stones</i>
3.0% stones	<i>Lentils, Sample Salvage</i>

Examples: Eastern Canada

Excerpt from grade determinant tables for
Lentils, Canada Red

*Grade name	Stones %
No. 1 Canada Red	0.1
No. 2 Canada Red	0.2
Extra No. 3 Canada Red	0.2
No. 3 Canada Red	0.2

* Defined in the *Canada Grain Regulations*

Basic grade:*Lentils, No. 1 Canada Red*

If the above sample contained	Grade in eastern Canada
0.2% stones	<i>Lentils, No. 2 Canada Red</i>
1.0% stones	<i>Lentils, Sample Canada Red Account Stones</i>
3.0% stones	<i>Lentils, Sample Salvage</i>

**Treated seed
and other
chemical
substances**
Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals—pink or red, canola—baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Lentils, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction “*Suspected Contaminated Grain, Handling Procedures*” for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Variety

On written request, the lentil variety forms part of the grade name, for example, No. 1 Canada, Laird.

▲ **Important:** State “Varietal purity not guaranteed” in the remarks section of grading certificates.

Primary grade determinants tables

Lentils, Canada, other than Red (CAN)

*Grade name	Standard of quality		*Contrasting colours	*Stained %	Damage			
	*Degree of soundness				*Heated %	*Peeled, split and broken %	*Other damage %	*Total %
No. 1 Canada	Uniform size, good natural colour		0.2	1.0	0.2	2.0	1.0	2.0
No. 2 Canada	Uniform size, reasonably good natural colour		0.5	4.0	0.5	3.5	2.0	3.5
Extra No. 3 Canada	Uniform size, fair colour		2.0	7.0	0.5	5.0	5.0	5.0
No. 3 Canada	Poor colour		3.0	-	1.0	10.0	10.0	10.0
Grade, if No. 3 specs not met		Lentils, Sample Canada Account Contrasting Colours			Lentils, Sample Canada Account Heated	Lentils, Sample Canada Account Damaged	Lentils, Sample Canada Account Damaged	Lentils, Sample Canada Account Damaged

*Grade name	Foreign material						*Total %
	Ergot %	Excreta %	Sclerotinia %	*Stones %	Other foreign material %		
No. 1 Canada	0.05	0.01	0.05	0.1	0.2	0.2	
No. 2 Canada	0.05	0.01	0.05	0.2	0.5	0.5	
Extra No. 3 Canada	0.05	0.01	0.05	0.2	0.5	0.5	
No. 3 Canada	0.05	0.01	0.05	0.2	1.0	1.0	
Grade, if No. 3 specs not met	Lentils, Sample Canada Account Ergot	Lentils, Sample Canada Account Excreta	Lentils, Sample Canada Account Admixture	2.5% or less—Lentils, Rejected (grade) Account Stones or Lentils, Sample Canada Account Stones Over 2.5%—Lentils, Sample Salvage	Lentils, Sample Canada Account Admixture	Lentils, Sample Canada Account Admixture	

* Defined in the Canada Grain Regulations Schedule III Table XXVIII

Lentils, Canada Red (CAN)

*Grade name	Standard of quality		*Contrasting classes %	Damage			
	*Degree of soundness			*Heated %	*Peeled, split and broken %	*Other damage %	*Total %
No. 1 Canada Red	Uniform size, good natural colour		0.2	0.2	2.0	1.0	2.0
No. 2 Canada Red	Uniform size, reasonably good natural colour		0.5	0.5	3.5	2.0	3.5
Extra No. 3 Canada Red	Uniform size, fair colour		2.0	0.5	5.0	5.0	5.0
No. 3 Canada Red	Poor colour		3.0	1.0	10.0	10.0	10.0
Grade, if No. 3 specs not met			Red Lentils, Sample Canada Account Contrasting Colours	Red Lentils, Sample Canada Account Heated	Red Lentils, Sample Canada Account Damaged	Red Lentils, Sample Canada Account Damaged	Red Lentils, Sample Canada Account Damaged

Foreign material							
*Grade name	Ergot %	Excreta %	Sclerotinia %	*Stones %	Other foreign material %	*Total %	
No. 1 Canada Red	0.05	0.01	0.05	0.1	0.2	0.2	
No. 2 Canada Red	0.05	0.01	0.05	0.2	0.5	0.5	
Extra No. 3 Canada Red	0.05	0.01	0.05	0.2	0.5	0.5	
No. 3 Canada Red	0.05	0.01	0.05	0.2	1.0	1.0	
Grade, if No. 3 specs not met	Red Lentils, Sample Canada Account Ergot	Red Lentils, Sample Canada Account Excreta	Red Lentils, Sample Canada Account Admixture	2.5% or less—Red Lentils, Rejected (grade) Account Stones, or Red Lentils, Sample Canada Account Stones Over 2.5%—Lentils, Sample Salvage	Red Lentils, Sample Canada Account Admixture	Red Lentils, Sample Canada Account Admixture	Red Lentils, Sample Canada Account Admixture

* Defined in the Canada Grain Regulations Schedule III Table XXVIII.1

Export shipments

Shipments can be commercially clean or not commercially clean.

Commercially clean (CC)

Shipments are considered commercially clean when they contain 0.2% or less by weight of dockage material. No dockage is reported.

Not commercially clean (NCC)

Shipments that do not meet the standards for commercial cleanliness are referred to as not commercially clean. Such shipments are allowed only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal and transfer elevators, dockage is reported to the nearest nearest 0.1%, less a direct deduction of up to 0.2%.

Processed shipments

For samples representing processed shipments from other than terminal and transfer elevators, dockage is reported to the nearest 0.1% and consists of the following

- Material that remains on top of the riddle, other than whole lentils which are handpicked and returned to the cleaned sample
- Material that passes through the selected sieve
- Material removed by aspiration
- Small broken lentils and portions of lentils whose weight exceeds 0.2% of the sample weight and which are removable through the No. 10 round-hole sieve and by aspiration

Grading

Where there are no export specifications, the primary specifications are used.

Export grade determinants tables

Lentils, Canada (CAN)

Grade name	Standard of quality	Contrasting colours %	Stained %	Damage			
	Degree of soundness			Heated %	Peeled, split and broken %	Other damage %	Total damage %
No. 1 Canada	Uniform size, good natural colour	0.2	1.0	0.2	2.0	1.0	2.0
No. 2 Canada	Uniform size, reasonably good natural colour	0.5	4.0	0.5	3.5	2.0	3.5
Extra No. 3 Canada	Uniform size, fair colour	2.0	7.0	0.5	5.0	5.0	5.0
No. 3 Canada	Poor colour	3.0	-	1.0	10.0	10.0	10.0

Grade name	Foreign material				
	Ergot %	Sclerotinia %	Stones %	Other foreign material %	Total foreign material %
No. 1 Canada	0.05	0.05	0.1	0.2	0.2
No. 2 Canada	0.05	0.05	0.2	0.5	0.5
Extra No. 3 Canada	0.05	0.05	0.2	0.5	0.5
No. 3 Canada	0.05	0.05	0.2	1.0	1.0

19. Beans

Determination of dockage	19-3
Definitions	19-3
Dockage not reported	19-3
Normal cleaning procedures	19-3
Composition of dockage	19-4
Optional analysis	19-4
Grading	19-5
Important definitions	19-5
Net weight of sample	19-5
Hazardous substances in samples	19-5
Representative portion for grading	19-5
Grading factors	19-6
Adhered soil	19-6
Broken	19-6
Classes	19-6
Colour	19-6
Contaminated seed	19-7
Contrasting classes	19-7
Damage	19-7
Earth pellets	19-7
Ergot	19-7
Excreta	19-8
Fertilizer pellets	19-8
Fireburnt	19-8
Foreign material	19-8
Heated	19-9
Magnesium spot	19-9
Mouldy	19-9
Mudball beans	19-9
Odour	19-9
Other classes of beans that blend	19-10
Rotted	19-10
Sclerotinia sclerotiorum	19-10
Soft earth pellets	19-10
Splits	19-10
Stones	19-11
Treated seed and other chemical substances	19-13
Variety	19-14
Special analyses	19-15
Split beans	19-15
Cracked seed coats	19-15

Primary and export grade determinants tables	19-16
Pea Beans, Canada (CAN)	19-16
Beans, Canada Cranberry, Blackeye or Yelloweye (CAN)	19-17
Beans, Canada, other than Cranberry, Blackeye, Yelloweye or Pea Beans (CAN)	19-18
Export shipments	19-19
Commercially clean	19-19
Not commercially clean	19-19
Grading	19-19

Determination of dockage

Definitions

Dockage is assessed and recorded to the nearest 0.1%. Dockage is assessed only on unprocessed samples of beans.

Dockage is defined under the Canada Grain Act as “any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain.” Dockage is removed by following the cleaning procedures described in this chapter.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage not reported

▲ **Important:** Dockage is not reported for samples grading

- *Beans, Sample Canada (class) Account Fireburnt*
- *Beans, Sample Salvage*
- *Beans, Sample Condemned*

Normal cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

Dockage is assessed only on unprocessed samples of beans. All foreign material in processed samples is assessed as grading factors.

1. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
 - Official samples should be at least 900 grams.
 - Unofficial samples should be at least 750 grams.
2. Choose the appropriate hand sieve for the size of the bean.
 - No. 8 slotted
 - No. 9 slotted
 - No. 11 slotted
3. Sieve the samples over the appropriate slotted sieve, using approximately 250 g at a time, to remove all readily removable material.
4. Handpick the portion remaining on top of the slotted sieve to remove all coarse foreign vegetable matter such as pods, stems, straw, thistle tops.

▲ **Important:** Do not remove mineral matter, ergot, sclerotinia, weed seeds or other grains.
5. Determine dockage. Use the list under *Composition of dockage*.

Composition of dockage

Dockage includes

- All material removed by sieving or handpicking or both, as defined in the previous section
- Soft earth pellets, which are pellets that crumble under light pressure, including earth pellets, fertilizer pellets, or pellets of any non-toxic material of similar consistency
- In unprocessed samples, mudballs handpicked from the cleaned sample

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal or transfer elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported and elevator stocks will be adjusted on the basis of the analysis. Agreement of the shipper and unload elevator must be conveyed to the CGC in writing prior to the analysis being performed.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
 - The percentage by gross weight to the nearest 0.1% and the grade of beans.
 - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
 - The percentage of dockage.

Example

95.0% Beans No. 1 CAN Cranberry

4.0% Domestic Mustard Seed, No. 1 CAN Oriental

1.0% dockage

Grading

Important definitions

Net weight of sample The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the net weight.

Hazardous substances in samples Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as “any pesticide, herbicide or desiccant.”

Representative portion for grading

All grading is done on representative portions divided down from the cleaned sample, using a Boemer-type divider.

When the concentration of the grading factor is . .	Then use . . .
Low	Optimum portion
High	Minimum portion or more (do not use less)

Values in this table represent a range of recommended portions of samples for grading.

Representative portion of beans for grading, grams

Grading factor	Minimum	Optimum	Export
Contrasting classes	100	500	500
Damage	100	500	500
Ergot	500	working sample	working sample
Excreta	working sample	working sample	working sample
Fireburnt	working sample	working sample	working sample
Foreign material	100	500	500
Heated, rotted, mouldy	100	500	500
Odour	working sample	working sample	working sample
Other classes of beans that blend	250	500	500
Sclerotinia sclerotiorum	500	working sample	working sample
Splits	100	500	500
Stones	100	working sample	working sample

Grading factors

Adhered soil Adhered soil is soil which clings to beans.

Representative portion for analysis

Minimum—100 g

Optimum—500 g

Export—500 g

Procedures

- Completely covered beans are called mudball beans. See *Mudball beans*.
- Otherwise, assess the amount of adhered soil against the colour standard.

**Broken
(BKN)** See *Splits*.

Classes There are numerous classes of beans; for example, cranberry beans, blackeye beans, turtle beans. The class of beans forms part of the grade name; for example, *Beans, No. 1 Canada Cranberry*.

**Colour
(CLR)** Colour is evaluated on the cleaned sample after the removal of splits and damaged beans. There is no numeric tolerance for colour. It is included in the evaluation of the standard of quality of the sample.

Standard of quality	Description (for grading)
Good natural colour	Beans may be slightly dull, slightly immature or have lightly adhered soil.
Reasonably good colour	Beans are moderately immature, with lightly adhered soil, or are lightly stained, or are lightly discoloured from storage.
Fairly good colour	Beans have moderately adhered soil or are stained, or moderately discoloured from storage.
Off colour	Beans cannot be considered of fairly good colour.

Sunburned or oxidized

In assessing colour which does not meet grade standards, you may also use the term *Sunburned or oxidized*, which is a normal discolouration of the seed coat occurring during storage. The colour may vary from light tan to brown or very dark brown, depending on the duration and conditions of storage.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

Procedure

Colour is assessed against the colour standard for the grade.

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the "Canada Grain Act" as; "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Beans, Sample Condemned*.

Contrasting classes (CON CL)

Beans of another class that contrast in colour, size or shape to the predominant beans in a sample are considered to be of a contrasting class.

Representative portion for analysis

Minimum—100 g

Optimum—500 g

Export—500 g

Damage (DMG)

Damaged beans include

- Whole, split, or broken beans that are sprouted, very immature, perforated, distinctly deteriorated or discoloured by weather or disease.
- Beans that are otherwise damaged in a way that seriously affects appearance or quality. This includes mudball beans in processed beans.

Representative portion for analysis

Minimum—100 g

Optimum—500 g

Export—500 g

Procedures

Beans showing some indication of possible internal damage are to be cut for confirmation of damage.

▲ **Important:** Damage is the most detrimental grading factor.
Refer to the Order of Precedence.

Earth pellets (EP)

- Hard earth pellets are pellets that do not crumble under light pressure.
See *Stones*.
- Soft earth pellets are pellets that crumble under light pressure.
See *Soft earth pellets*.

Ergot (ERG)

Ergot is a plant disease producing elongated fungus bodies with a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.

Representative portion for analysis

Minimum—500 g

Optimum—working sample

Export—working sample

**Excreta
(EXCR)**

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

**Fertilizer
pellets
(FERT PLTS)**

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Beans, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

**Fireburnt
(FBNT)**

Fireburnt beans are beans charred or scorched by fire. A cross-section of a fireburnt bean resembles charcoal with numerous air holes. The air holes result in a low weight bean which crumbles easily under pressure.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

Procedure

Samples of beans containing any fireburnt seeds are graded *Beans, Sample Canada (class) Account Fireburnt*.

**Foreign
material
(FM)**

This includes any material other than beans or split beans not removed in cleaning.

Representative portion for analysis

Minimum—100 g

Optimum—500 g

Export—500 g

**Heated
(HTD)**

Heated, rotted, and mouldy are included in the same tolerance.

Pea beans

Heating is indicated by a dull seed coat varying from cream to mahogany in colour. The colour is more intense in the hilum area. When viewed in cross-section, the cotyledons vary in colour from tan to dark brown. Very light tan cotyledons are considered damaged rather than heated.

Red kidney beans

Heating is indicated by a dull seed coat, dark red to black in colour.

Representative portion for analysis

Minimum—100 g

Optimum—500 g

Export—500 g

Procedure

To determine the degree of damage, split the bean. Do not cut it crosswise.

**Magnesium
spot**

Magnesium spot is a black spot penetrating the cotyledon, most commonly found in cranberry beans. Affected beans are considered damaged.

Representative portion for analysis

Minimum—100 g

Optimum—250 g

Export—100 g

Procedures

To confirm suspected magnesium spot, split beans to expose the cotyledons.

**Mouldy
(MLDY)**

Mouldy beans are characterized by the presence of dark blue exterior moulds that develop in machine-damaged crevices. Light and dark red kidney beans may develop yellow to black interior moulds in the concave centre area. Heated, rotted, and mouldy are included in the same tolerance.

Representative portion for analysis

Minimum—100 g

Optimum—500 g

Export—500 g

Mudball beans

Mudball beans are beans that are completely covered with caked-on mud.

- In processed samples, mudball beans are considered *Damage*.
- In unprocessed samples, mudball beans are considered *dockage*.

**Odour
(ODOR)**

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

Representative portion for analysisMinimum—working
sampleOptimum—working
sampleExport—working
sample

If odour is the grade determinant and there is . . .	Then the grade is . . .
An objectionable odour, not heated or fireburnt	<i>Beans, Sample Canada Account Odour</i>
A heated odour	<i>Beans, Sample Canada Account Heated</i>
A fireburnt odour	<i>Beans, Sample Canada Account Fireburnt</i>

**Other classes
of beans
that blend
(OCLBB)**

Classes of beans that blend are sound beans of other classes which are similar in colour, size and shape to the predominant beans in a sample.

Representative portion for analysis

Minimum—250 g

Optimum—500 g

Export—500 g

**Rotted
(ROT)**

Rotted beans are whole beans or pieces of beans that are visibly in advanced stages of decomposition and that feel spongy under pressure. Heated, rotted, and mouldy are included in the same tolerance.

Representative portion for analysis

Minimum—100 g

Optimum—500 g

Export—500 g

**Sclerotinia
sclerotiorum
(SCL)**

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, and have a dark black exterior, a pure white interior and a coarse surface texture.

Sclerotinia attacks broadleaf crops only. It should not be confused with ergot. Sclerotinia is not toxic.

Representative portion for analysis

Minimum—500 g

Optimum—working
sampleExport—working
sample**Soft earth
pellets
(SEP)**

Soft earth pellets are pellets that crumble under light pressure—if they do not crumble, they are considered *Stones*. These pellets can be

- Earth and fertilizer pellets
- Any non-toxic material of similar consistency

Earth pellets are classed as foreign material.

**Splits
(SPLT)**

Splits include split beans, broken pieces of beans that are less than three-quarters of whole kernels, and halves of beans that are loosely held together by cracked seed coats.

▲ **Important:** Splits do not include beans that are otherwise damaged. In other words, if a split is damaged, it is graded as *Damage*, not as splits.

Representative portion for analysis

Minimum—100 g

Optimum—500 g

Export—500 g

Procedures

Use a slotted sieve to help separate splits. Return to the sample any whole beans which pass through the sieve.

**Stones
(STNS)**

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Representative portion for analysis

Minimum—250 g

Optimum—working
sampleExport—working
sample**Procedures**

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.
 - In western Canada samples of grain containing stones in excess of “basic grade” tolerances, up to 2.5% are graded *Beans, Rejected “basic grade” Account Stones*. The “basic grade” refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
 - In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Beans, Sample Canada Account Stones*.
 - In western and eastern Canada grain containing more than 2.5% stones is graded *Beans, Sample Salvage*.

Examples: Western Canada

Excerpt from grade determinant tables for
Beans, Canada Cranberry, Blackeye or Yelloweye Canada

*Grade name	Stones %
Extra No. 1 Canada	Nil
No. 1 Canada	0.05
No. 1 Canada Select	0.05
No. 2 Canada	0.1
No. 3 Canada	0.2
No. 4 Canada	0.5

* Defined in the *Canada Grain Regulations*

Basic grade:*Beans, No. 2 Canada Cranberry*

Reason for basic grade:0.2% Heated

If the above sample contained	Grade in western Canada
0.2% stones	<i>Beans, Rejected No. 2 Canada Cranberry Account Stones</i>
1.0% stones	<i>Beans, Rejected No. 2 Canada Cranberry Account Stones</i>
3.0% stones	<i>Beans, Sample Salvage</i>

Examples: Eastern Canada

Excerpt from grade determinant tables for
Beans, Canada Cranberry, Blackeye or Yelloweye Canada

*Grade name	Stones %
Extra No. 1 Canada	Nil
No. 1 Canada	0.05
No. 1 Canada Select	0.05
No. 2 Canada	0.1
No. 3 Canada	0.2
No. 4 Canada	0.5

*Defined in the *Canada Grain Regulations*

Basic grade:Beans, No. 2 Canada Cranberry

Reason for basic grade:0.2% Heated

If the above sample contained	Grade in eastern Canada
0.2% stones	Beans, No. 3 Canada Cranberry
1.0% stones	Beans, Sample Canada Cranberry Account Stones
3.0% stones	Beans, Sample Salvage

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals—pink or red, canola—baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysisMinimum—working
sampleOptimum—working
sampleExport—working
sample

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Beans, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction “*Suspected Contaminated Grain, Handling Procedures*” for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Variety

Beans are graded without reference to variety.

Special analyses

Upon request, samples may be analyzed for other factors. The shipper of the beans indicates which factors are to be analyzed and which sieves to use.

Split beans

Use a slotted sieve to help in separating splits from whole beans.

Record all percentages to two decimal places.

Factor	Minimum representative portion to analyse g
Foreign material	500
Sound whole or sound splits	100
Damaged whole or damaged splits	100

Cracked seed coats (CSDC)

Cracked seed coats include

- Beans with any cracked seed coats
- Beans with a piece of seed coat missing
- Beans with a seed coat punctured by insect or other means

Primary and export grade determinants tables

Pea Beans, Canada (CAN)

*Grade name	*Standard of quality	*Other classes that blend %
Extra No. 1 Canada	Uniform size, good natural colour	1.0
Canada No. 1 Select	Fairly good colour	1.0
No. 1 Canada	Reasonably good colour	1.0
No. 2 Canada	Fairly good colour	5.0
No. 3 Canada	Fairly good colour	5.0
No. 4 Canada	Off-colour	5.0
Grade, if No. 4 specs not met		Pea Beans, Sample Canada Account Other Classes That Blend

*Grade name	Foreign material				*Contrasting classes %	Heated, rotted, mouldy %	*Total damage, foreign material, and contrasting classes %	*Total damage, including splits, foreign material and contrasting classes %
	Ergot %	Sclerotinia %	*Stones, shale or similar material %	*Total %				
Extra No. 1 Canada	0.05	0.05	0.01	0.05	0.1	Nil	1.0	1.0
Canada No. 1 Select	0.05	0.05	0.01	0.05	0.1	0.2	1.5	2.0
No. 1 Canada	0.05	0.05	0.05	0.1	0.1	0.1	1.5	2.0
No. 2 Canada	0.05	0.05	0.1	0.2	1.0	0.2	3.0	4.0
No. 3 Canada	0.05	0.05	0.2	0.5	1.0	0.3	5.0	6.0
No. 4 Canada	0.05	0.05	0.2	0.5	1.0	1.0	8.5	10.0
Grade, if No. 4 specs not met	Pea Beans, Sample Canada Account Ergot	Pea Beans, Sample Canada Account Sclerotinia	2.5% or less—Pea Beans, Rejected (grade) Account Stones, or Pea Beans, Sample Canada Account Stones Over 2.5%—Pea Beans, Sample Salvage	Pea Beans, Sample Canada Account Admixture	Pea Beans, Sample Canada Account Contrasting Classes	Pea Beans, Sample Canada Account Heated or Account Mouldy Kernels	Pea Beans, Sample Canada Account (reason)	Pea Beans, Sample Canada Account (reason)

* Defined in the Canada Grain Regulations Schedule III Table XXV

Beans, Canada Cranberry, Blackeye or Yelloweye (CAN)

*Grade name	*Standard of quality	*Other classes that blend %
Extra No. 1 Canada	Uniform size, good natural colour	10
No. 1 Canada	Reasonably good colour	30
No. 1 Canada Select	Fairly good colour	30
No. 2 Canada	Reasonably good colour	50
No. 3 Canada	Fairly good colour	100
No. 4 Canada	Off-colour	150
Grade, if No. 4 specs not met		Beans, Sample Canada (class) Account Other Classes That Blend

*Grade name	Foreign material				*Contrasting classes %	Heated, rotted, mouldy %	*Total damage, foreign material, and contrasting classes %	*Total damage, including splits, foreign material and contrasting classes %
	Ergot %	Sclerotinia %	*Stones, shale or similar material %	*Total %				
Extra No. 1 Canada	0.05	0.05	Nil	0.05	1.0	Nil	1.0	1.0
No. 1 Canada	0.05	0.05	0.05	0.1	1.5	0.1	1.5	3.5
No. 1 Canada Select	0.05	0.05	0.05	0.1	1.5	0.1	1.5	3.5
No. 2 Canada	0.05	0.05	0.1	0.2	3.0	0.2	3.0	5.5
No. 3 Canada	0.05	0.05	0.2	0.5	5.0	0.3	5.0	7.5
No. 4 Canada	0.05	0.05	0.5	1.0	8.5	1.0	8.5	10.0
Grade, if No. 4 specs not met	Beans, Sample Canada (class) Account Ergot	Beans, Sample Canada (class) Account Sclerotinia	2.5% or less—Beans, Rejected (grade) (class) Account Stones, or Beans, Sample Canada (class) Account Stones Over 2.5%—Beans, Sample Salvage	Beans, Sample Canada Account Admixture	Beans, Sample Canada (class) Account Contrasting Classes	Beans, Sample Canada (class) Account Heated or Account Mouldy, Kernels	Beans, Sample Canada (class) Account (reason)	Beans, Sample Canada (class) Account (reason)

* Defined in the Canada Grain Regulations Schedule III Table XXVI

Note: The class name is added to the grade name.

Beans, Canada, other than Cranberry, Blackeye, Yelloweye or Pea Beans (CAN)

*Grade name	*Standard of quality	*Other classes that blend %
Extra No. 1 Canada	Uniform size, good natural colour	1.0
No. 1 Canada	Reasonably good colour	3.0
No. 1 Canada Select	Fairly good colour	3.0
No. 2 Canada	Reasonably good colour	5.0
No. 3 Canada	Fairly good colour	10.0
No. 4 Canada	Off-colour	15.0
Grade, if No. 4 specs not met		Beans, Sample Canada (class) Account Other Classes That Blend

*Grade name	Foreign material				*Contrasting classes %	Heated, rotted, mouldy %	*Total damage, foreign material, and contrasting classes %	*Total damage, including splits, foreign material and contrasting classes %
	Ergot %	Sclerotinia %	*Stones, shale or similar material %	*Total %				
Extra No. 1 Canada	0.05	0.05	Nil	0.05	1.0	Nil	1.0	1.0
No. 1 Canada	0.05	0.05	0.05	0.1	1.5	0.1	1.5	2.0
No. 1 Canada Select	0.05	0.05	0.05	0.1	1.5	0.1	1.5	2.0
No. 2 Canada	0.05	0.05	0.1	0.2	3.0	0.2	3.0	4.0
No. 3 Canada	0.05	0.05	0.2	0.5	5.0	0.3	5.0	6.0
No. 4 Canada	0.05	0.05	0.5	1.0	8.5	1.0	8.5	10.0
Grade, if No. 4 specs not met	Beans, Sample Canada (class) Account Ergot	Beans, Sample Canada (class) Account Sclerotinia	2.5% or less—Beans, Rejected (grade) (class) Account Stones or Beans, Sample Canada (class) Account Stones Over 2.5%—Beans, Sample Salvage	Beans, Sample Canada (class) Account Admixture	Beans, Sample Canada (class) Account Contrasting Classes	Beans, Sample Canada (class) Account Heated or Account Mouldy Kernels	Beans, Sample Canada (class) Account (reason)	Beans, Sample Canada (class) Account (reason)

* Defined in the Canada Grain Regulations Schedule III Table XXVII

Note: The class name is added to the grade name.

Export shipments

Shipments can be commercially clean or not commercially clean.

**Commercially
clean
(CC)**

Shipments are considered commercially clean when they contain no dockage material.

**Not
commercially
clean
(NCC)**

Shipments that do not meet the standards for commercial cleanliness are referred to as not commercially clean. Such shipments are permitted only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal and transfer elevators, dockage is reported to the nearest 0.1%, less a deduction of up to 0.2%.

Grading

Beans on export are graded in accordance with primary standards and specifications.

20. Soybeans

Determination of dockage	20-3
Normal cleaning procedures	20-3
Composition of dockage	20-4
Optional analysis	20-4
Grading	20-5
Important definitions	20-5
Net weight of sample	20-5
Kernel counts	20-5
Hazardous substances in samples	20-5
Representative portions for grading	20-5
Grading factors	20-6
Colour	20-6
Contaminated grain	20-6
Damage	20-6
Downy mildew	20-6
Earth pellets	20-6
Ergot	20-7
Excreta	20-7
Fertilizer pellets	20-7
Fireburnt	20-7
Foreign material	20-8
Foreign material other than grain	20-8
Frost	20-8
Heated	20-8
Hulls	20-8
Mottled kernels	20-8
Mouldy	20-9
Mudball soybean	20-9
Odour	20-9
Other grains	20-9
Pokeweed stain	20-10
Rancid	20-10
Sclerotinia sclerotiorum	20-10
Seed coats	20-10
Shrivelled	20-10
Soft earth pellets	20-11
Splits	20-11
Sprouted	20-11
Stained and mottled	20-11
Stones	20-12
Treated seed and other chemical substances	20-14
Uniform in size	20-15
Variety	20-15

Special analyses	20-16
Hilum colour (white hilum)	20-16
Sizing	20-16
Primary and export grade determinants tables	20-17
Soybeans, Canada Yellow, Green, Brown, Black or Mixed, (CAN)	20-17
Export shipments	20-19
Commercially clean	20-19
Not commercially clean	20-19
Grading	20-19

Determination of dockage

Dockage is assessed and recorded to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as “any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain.” Dockage is removed by following the cleaning procedures described in this section of the guide.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

▲ **Important:** Dockage is not reported for samples graded as

- *Soybeans, Sample Canada (colour) Account Fireburnt*
- *Soybeans, Sample Salvage*
- *Soybeans, Sample Condemned*

Normal cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

Samples that are commercially clean do not go through the Carter dockage tester.

1. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
 - Official samples should be at least 900 g.
 - Unofficial samples should be at least 750 g.
2. Sieve the samples over the No. 8 round-hole hand sieve, using approximately 250 g at a time, to remove all readily removable material.
3. Set up the Carter dockage tester as follows:

Feed control	#10
Air control	#7
Riddle	none
Top sieve	blank tray
Centre sieve	none
Bottom sieve	none
Sieve cleaner control	off

4. Turn on the Carter dockage tester.
5. Pour the sample into the hopper.

6. After the sample has passed through the machine, turn off the machine.
7. Lightly snap the retainer rod of the aspiration pan to loosen material gathered on the air screen.
8. Determine dockage, using the list under *Composition of dockage*.

Composition of dockage

- Material passing through the No. 8 round-hole sieve
- Up to 10.0% by weight of soft earth pellets handpicked from the sample
- Stems, pods, hulls, loose soybean seed coats, and coarse vegetable matter removed through aspiration with the Carter dockage tester, or handpicked from the sample.

▲ **Important:** Return all pieces of soybeans or whole soybeans, sclerotinia, ergot, weed seeds or other grains removed by aspiration to the sample where they are assessed as grading factors.

Aspiration is used only as an aid to help speed up the removal of lightweight dockage material from the sample.

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal or transfer elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported and elevator stocks will be adjusted on the basis of the analysis. Agreement of the shipper and unload elevator must be conveyed to the CGC in writing prior to the analysis being performed.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
 - The percentage by gross weight to the nearest 0.1% and the grade of soybeans.
 - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
 - The percentage of dockage.

Example

95.0% Soybeans, No. 1 CAN, Yellow

4.0% Domestic Mustard Seed, No. 1 CAN Oriental

1.0% dockage

Grading

Important definitions

Net weight of sample The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of net weight.

Kernel counts (K)

- To do kernel counts you must have 500 grams of cleaned sample.
- All grading is done on representative portions divided down from the cleaned sample using a Boemer-type divider.

Hazardous substances in samples Wear gloves to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide or desiccant."

Representative portions for grading

All grading is done on representative portions divided down from the cleaned sample, using a Boemer-type divider.

When the grading factor is . . .	Then use . . .
Normal	Optimum portion size
Severe	Minimum portion size or more (do not use less)

Values in this table represent a range of recommended portions.

Representative portion of soybeans for grading, grams

Grading factor	Minimum	Optimum	Export
Colour	working sample	working sample	working sample
Damage	50	250	250
Downy mildew	nil	250	250
Ergot	working sample	working sample	working sample
Excreta	working sample	working sample	working sample
Fireburnt	working sample	working sample	working sample
Foreign material	100	500	500
Heated, mouldy, rancid	50	500	working sample
Odour	working sample	working sample	working sample
Sclerotinia sclerotiorum	100	working sample	working sample
Soft earth pellets	100	500	working sample
Splits, seed coats	100	500	500
Stained, mottled	working sample	working sample	working sample
Stones	500	500	working sample

Grading factors

**Colour
(CLR)**

Soybeans may be yellow, green, brown or black. Colour is part of the grade name; for example, *Soybeans, No. 1 Canada Yellow*.

Bicoloured or mixed soybeans

- Mixed soybeans are samples containing bicoloured soybeans or soybeans of another colour.
- Bicoloured soybeans are yellow or green soybeans with black or brown pigmented streaks or blotches in the seed coats.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

**Contaminated
grain**

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the "*Canada Grain Act*" as: "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Soybeans, Sample Condemned*.

**Damage
(DMG)**

Damaged soybeans include those which are sprouted, frost-damaged, shrivelled, ground-damaged, immature, or otherwise unsound.

Representative portion for analysis

Minimum—50 g

Optimum—250 g

Export—250 g

**Downy mildew
(DWN MIL)**

Downy mildew is a superficial coating of downy or powdery fungal growth. An individual soybean is considered affected only if all of the fungal growth could be pulled together and the growth covers 50% or more of the surface area of the soybean.

Representative portion for analysis

Minimum—nil

Optimum—250 g

Export—250 g

Earth pellets

- Hard earth pellets are pellets that do not crumble under light pressure.
See *Stones*.
- Soft earth pellets are pellets that crumble under light pressure.
See *Soft earth pellets*.

**Ergot
(ERG)**

Ergot is a plant disease producing elongated fungus bodies with a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture. Ergot is toxic.

Ergot attacks cereal crops and is not usually present in soybeans, which are a broadleaf crop.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

**Excreta
(EXCR)**

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

**Fertilizer
pellets
(FERT PLTS)**

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Soybeans, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

**Fireburnt
(FBNT)**

Fireburnt soybeans are seeds charred or scorched by fire. A cross-section of a fireburnt seed resembles charcoal with numerous air holes. The air holes result in a low weight seed which crumbles easily under pressure.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

Procedure

Samples of soybeans containing fireburnt seeds are graded as *Soybeans, Sample Canada Account Fireburnt*.

Foreign material (FM)

Foreign material includes any material other than whole soybeans or split soybeans left in the sample after the removal of dockage.

Representative portion for analysis

Minimum—100 g

Optimum—500 g

Export—500 g

Foreign material other than grain (FMXGRN)

Foreign material other than grain does not include ergot or stones, but does include

- Large weed seeds that did not pass through the No. 8 round-hole sieve
- Soft earth pellets which crumble under light pressure
- Soft fertilizer pellets
- Any other non-toxic material of a similar consistency
- Sclerotinia

Representative portion for analysis

Minimum—100 g

Optimum—500 g

Export—500 g

Frost (FR)

Frost-damaged soybeans, when cut in cross-section, are

- Soybeans whose cotyledons are green or greenish-brown with a glassy wax-like appearance are considered frost-damaged.
- Seeds that are yellow or very pale green are considered sound, even if they are superficially affected by weathering.

Representative portion for analysis

Minimum—50 g

Optimum—500 g

Export—500 g

Heated (HTD)

- Soybeans with a light to dark brown cotyledon when cut in cross section are considered heated.
- Soybeans with a very light tan cotyledon when cut in cross section are considered damaged. See *Damage*.
- Soybeans with light pink seed coats are considered in the overall assessment of colour.

Representative portion for analysis

Minimum—50 g

Optimum—500 g

Export—working sample

Hulls (HULLS)

See *Seed coats*.

Mottled kernels See *Stained and mottled*.

**Mouldy
(MLDY)**

Mouldy soybeans are wrinkled and misshapen, and range in colour from medium to dark brown. Large areas of the affected bean are superficially covered with a grey mould. Mouldy beans often have a spongy texture and usually give off an unpleasant odour. They are included in the tolerance for *Heated*.

Representative portion for analysis

Minimum—50 g

Optimum—500 g

Export—working
sample**Mudball
soybean**

A soybean completely covered with caked-on mud is considered damaged.

Representative portion for analysis

Minimum—100 g

Optimum—500 g

Export—500 g

**Odour
(ODOR)**

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

Grains grading No. 1 through 3 must have a natural odour. A sample would have to grade No. 4 for Damage before it could have a slight odour associated with low quality soybeans.

Representative portion for analysisMinimum—working
sampleOptimum—working
sampleExport—working
sample

If odour is the grade determinant and there is . . .	Then the grade is . . .
If there is a distinct unnatural or objectionable odour not associated with the quality of the grain, but not heated or fireburnt	<i>Soybean, Sample Canada (colour) Account Odour</i>
A heated odour	<i>Soybean, Sample Canada (colour), Heated</i>
A fireburnt odour	<i>Soybean, Sample Canada (colour), Fireburnt</i>

**Other grains
(OGS)**

All grains other than soybeans that remain in the sample after cleaning are considered other grains.

Representative portion for analysis

Minimum—100 g

Optimum—500 g

Export—500 g

Pokeweed stain

Pokeweed stain is a bright red staining of the soybean seed coat caused by the sap of the pokeweed berry. In some cases, the staining may appear similar to pesticide treated seeds of soybeans.

▲ **Important:** Do not confuse pokeweed stain with pesticide treated seed or contaminated grain.

Rancid

Soybeans in various stages of rancidity are characterized by a deep pink discolouration on the seed coat and varying degrees of discolouration of the cotyledon.

Seeds having a deep pink discolouration on the seed coat are cut and, based upon the extent of discolouration of the cotyledon, assessed as follows:

Discolouration of cotyledon	Assess as
No discolouration of cotyledon to slight discolouration just below seed coat.	Considered in the evaluation of colour.
Pink discolouration of cotyledon greater than just below the seed coat level but not throughout the entire seed.	Considered as <i>Damage</i> .
Pink discolouration extends throughout cotyledon.	Considered rancid and included in tolerance for <i>Heated</i> .

Representative portion for analysis

Minimum—50 g

Optimum—500 g

Export—working sample

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, and have a dark black exterior, a pure white interior and a coarse surface texture. Sclerotinia attacks only broadleaf crops. It is not toxic, and it must not be confused with ergot.

Representative portion for analysis

Minimum—100 g

Optimum—working sample

Export—working sample

Seed coats

- In unprocessed samples, loose seed coats are assessed as dockage.
- In commercially clean samples, loose seed coats are assessed as *Splits*.

Shrivelled

If the soybean is shrivelled, small and flat, it has no oil value and is considered *Damaged*.

Representative portion for analysis

Minimum—100 g

Optimum—500 g

Export—500 g

Soft earth pellets (SEP)

Soft earth pellets are pellets that crumble under light pressure—if they do not crumble, they are considered stones. These pellets can be

- Earth and fertilizer pellets
- Any non-toxic material of similar consistency

Representative portion for analysis

Minimum—100 g

Optimum—500 g

Export—working sample

Procedure

- Earth pellets may be removed as dockage. See *Normal cleaning procedures*.
 - If soft earth pellets are over 10.0% of the gross weight of the sample, they become a grading factor, included in the tolerance for *Foreign material other than grain*.
1. Return the pellets to the sample.
 2. Handpick soft earth pellets from a representative portion of the cleaned sample.
 3. If soft earth pellets are the grade determinant, grade the sample *Soybeans, Sample Canada (colour, Account Admixture)*.

Splits (SPLT)

Splits include split soybeans, split beans of other classes, broken seeds that are less than three-quarters of the whole seed, and cotyledons that are loosely held together by the seed coat.

Representative portion for analysis

Minimum—100 g

Optimum—500 g

Export—500 g

Procedure

1. Any slotted hand sieve may be used to help separate splits from the sample.
2. Handpick any small whole soybeans that pass through the sieve and return them to the sample.
3. Handpick the remaining splits in the sample and add them to those removed by sieving.
4. Determine the total percentage by weight of splits.

Sprouted

If a soybean shows evidence of sprouting, it is *Damaged*.

Representative portion for analysis

Minimum—100 g

Optimum—500 g

Export—500 g

Stained and mottled (STND)

Staining or mottling on the surface is caused by weather, dirt, weed stain, or disease. If the soybeans are not damaged or discoloured internally, they are considered sound. See *Pokeweed stain*.

Limits are visible in the Canada standard samples, and are defined under standard of quality as

Good natural colour	Canada No. 1
Slightly stained	Canada No. 2
Stained	Canada No. 3
Badly stained	Canada No. 4 or 5

Representative portion for analysis

Minimum—working sample	Optimum—working sample	Export—working sample
---------------------------	---------------------------	--------------------------

Procedure

Evaluate the stain or mottling according to its effect on the general appearance of the sample.

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Representative portion for analysis

Minimum—500 g	Optimum—500 g	Export—working sample
---------------	---------------	--------------------------

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.
 - In western Canada samples of grain containing stones in excess of “basic grade” tolerances, up to 2.5% are graded *Soybeans, Rejected “basic grade” Account Stones*. The “basic grade” refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
 - In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Soybeans, Sample Canada (colour) Account Stones*.
 - In western and eastern Canada grain containing more than 2.5% stones is graded *Soybeans, Sample Salvage*.

Examples: Western Canada

Excerpt from grade determinant tables for
Soybeans, Canada

*Grade name	Stones
No. 1 Canada	Nil
No. 2 Canada	1K
No. 3 Canada	3K
No. 4 Canada	3K
No. 5 Canada	3K

* Defined in the *Canada Grain Regulations*

K Number of kernel-sized pieces in 500 g

Basic grade: *Soybeans, No. 2 Canada Yellow*

Reason for basic grade: 0.2% Heated

If the above sample contained	Grade in Western Canada
2K stones	<i>Soybeans, Rejected No. 2 Canada Yellow</i>
10K stones	<i>Soybeans, Rejected No. 2 Canada Yellow</i>
3.0% stones	<i>Soybeans, Sample Salvage</i>

Examples: Eastern Canada

Excerpt from grade determinant tables for
Soybeans, Canada

*Grade name	Stones
No. 1 Canada	Nil
No. 2 Canada	1K
No. 3 Canada	3K
No. 4 Canada	3K
No. 5 Canada	3K

* Defined in the *Canada Grain Regulations*

K Number of kernel-sized pieces in 500 g

Basic grade: *Soybeans, No. 2 Canada Yellow*

Reason for basic grade: 0.2% Heated

If the above sample contained	Grade in Eastern Canada
0.08% stones	<i>Soybeans, No. 3 Canada Yellow</i>
1.0% stones	<i>Soybeans, Sample Canada Yellow Account Stones</i>
3.0% stones	<i>Soybeans, Sample Salvage</i>

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals—pink or red, canola—baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Soybeans, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspected Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

▲ **Important:** Do not confuse pesticide treated seed with pokeweed stain, which is similar.

**Uniform
in size**

Samples are considered to be uniform in size when there is no distinct difference in seed size. Use the Standard sample as a guide to determine uniformity.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

Variety

Soybeans are graded without reference to variety.

Special analyses

Upon request, samples may be analyzed for other factors. The shipper of the soybeans indicates which factors are to be analyzed and which sieves to use.

Hilum colour (white hilum)

Hilum colour is not a grading factor.

Handpick a representative portion of not less than 100 g of the cleaned sample to determine the percentage by weight of Hilum colour.

Sizing

Analyse a representative portion of not less than 500 g of the cleaned sample. The shipper specifies the sieve size.

Primary and export grade determinants tables

Soybeans, Canada Yellow, Green, Brown, Black or Mixed (CAN)

*Grade name	Standard of quality	
	*Minimum test weight kg/hL (g/0.5 L)	*Degree of soundness
No. 1 Canada	70.0 (357)	Cool, natural odour, uniform in size, good natural colour
No. 2 Canada	68.0 (347)	Cool, natural odour, may be slightly stained
No. 3 Canada	66.0 (337)	Cool, natural odour; may be stained, not badly ground-damaged
No. 4 Canada	63.0 (322)	Cool, may be badly stained, ground-damaged or frost-damaged
No. 5 Canada	59.0 (301)	Cool, may be badly stained, ground-damaged, immature or frost-damaged
Grade, if No. 5 specs not met	Soybeans, Sample Canada (colour) Account Light Weight	

* Defined in the *Canada Grain Regulations* Schedule III Table XIX.

Note: The colour is added to the grade name.

Soybeans, Canada Yellow, Green, Brown, Black or Mixed (CAN), continued

*Grade name	Damage		Downy mildew	*Other colours or bicoloured other than for mixed soybeans	Ergot %	Foreign material			*Splits %
	*Heat-damaged or moldy %	*Total %				Stones %	*Foreign material other than grain %	*Total %	
No. 1 Canada	Nil	2.0	1.0	2.0	0.01	Nil	0.1	1.0	10.0
No. 2 Canada	0.2	3.0	10.0	3.0	0.025	1K	0.3	2.0	15.0
No. 3 Canada	1.0	5.0	-	5.0	0.1	3K	0.5	3.0	20.0
No. 4 Canada	3.0	8.0	-	10.0	0.25	3K	2.0	5.0	30.0
No. 5 Canada	5.0	15.0	-	15.0	0.25	3K	3.0	8.0	40.0
Grade, if No. 5 specs not met	Soybeans, Sample Canada (colour) Account Heated or Mouldy	Soybeans, Sample Canada (colour) Account Damaged		Appropriate mixed grade	Soybeans, Sample Canada (colour) Account Ergot	2.5% or less—Soybeans, Rejected (grade) Account Stones, or Soybeans, Sample Canada (colour) Account Stones Over 2.5%—Soybeans, Sample Salvage	Soybeans, Sample Canada (colour) Account Admixture	Soybeans, Sample Canada (colour) Account Admixture	Soybeans, Sample Canada (colour) Account Splits

* Defined in the Canada Grain Regulations Schedule III Table XIX

K Number of kernel-sized pieces in 500 g

Note: The colour is added to the grade name.

Export shipments

Shipments can be commercially clean or not commercially clean.

Commercially clean

No dockage is assessed on commercially clean shipments.

Samples are considered commercially clean when the sample contains 0.2% or less by weight of pods, stems, or coarse vegetable matter, including 0.1% or less of material other than whole or broken soybeans that passes through the No. 8 round-hole sieve.

In addition, in samples of commercially clean shipments, the amount of finely broken soybeans that passes through a No. 8 round-hole sieve

- On shipments not for direct export, can be up to 0.75% by weight
- On shipments for direct export, can be up to 1.0% by weight

Not commercially clean (NCC)

Shipments which do not meet the definition of commercially clean are considered not commercially clean and are allowed only with the permission of the CGC. Dockage is reported to the nearest 0.1%.

Grading

Soybeans on export are graded in accordance with primary grade standards and specifications.

21. Fababeans

Determination of dockage	21-3
Definitions	21-3
Dockage not reported	21-3
Normal cleaning procedures	21-3
Composition of dockage	21-3
Optional analysis	21-3
Grading	21-5
Important definitions	21-5
Net weight of sample	21-5
Kernel counts	21-5
Hazardous substances in samples	21-5
Representative portions for grading	21-5
Grading factors	21-6
Blackened	21-6
Colour	21-6
Contaminated grain	21-6
Cracked	21-7
Cracked seed coats	21-7
Damage	21-7
Discoloured	21-7
Earth pellets	21-7
Ergot	21-7
Excreta	21-8
Fertilizer pellets	21-8
Fireburnt	21-8
Foreign material	21-9
Green	21-9
Heated	21-9
Mouldy	21-9
Odour	21-9
Perforated	21-10
Rime	21-10
Rotted	21-10
Sclerotinia sclerotiorum	21-10
Soft earth pellets	21-10
Splits	21-11
Sprouted	21-11
Stones	21-11
Treated seed and other chemical substances	21-13
Varieties	21-13

Primary grade determinants tables	21-14
Fababeans, Canada (CAN)	21-14
Export shipments	21-15
Commercially clean	21-15
Not commercially clean	21-15
Grading	21-15
Export grade determinants	21-16
Fababeans, Canada (CAN)	21-16

Determination of dockage

Definitions

Dockage is assessed and recorded to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as “any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain.” Dockage is removed by following the cleaning procedures described in this section of the guide.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage not reported

▲ **Important:** Dockage is not reported for samples graded

- *Fababeans, Sample Canada Account Fireburnt*
- *Fababeans, Sample Salvage*
- *Fababeans, Sample Condemned*

Normal cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

1. Using a Boerner-type divider, divide the uncleaned sample to obtain two or more representative portions of approximately 250 g each.
2. Select the appropriate hand sieve, either No. 8, No. 9 or No. 11 slotted hand sieve.
3. Sieve the portions one at a time over the appropriate hand sieve to remove all readily removable material.
4. Determine dockage, using the list under *Composition of dockage*.

Composition of dockage

- Material handpicked from the sieved sample, including all coarse foreign vegetable matter such as pods, stems, straw, and thistle tops—

▲ **Important:** Do not include mineral matter, ergot, sclerotinia, or large-seeded grains other than fababeans.

- Soft earth pellets, if they are 10.0% or less of the uncleaned sample by weight

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal or transfer elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported and elevator stocks will be adjusted on the basis of the analysis.

Agreement of the shipper and unload elevator must be conveyed to the CGC in writing prior to the analysis being performed.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
 - The percentage by gross weight to the nearest 0.1% and the grade of fababeans.
 - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
 - The percentage of dockage.

Example

95.0% Fababeans, No. 1 CAN

4.0% Domestic Mustard Seed, No. 1 CAN Oriental

1.0% dockage

Grading

Important definitions

- Net weight of sample** The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the net weight.
- Kernel counts (K)** A kernel count is the number of kernel-sized pieces of a foreign material in 500 g of cleaned sample.
- To do kernel counts, you must have 500 grams of cleaned sample.
 - All grading is done on representative portions divided down from the cleaned sample using a Boemer-type divider.
- Hazardous substances in samples** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide or desiccant."

Representative portions for grading

All grading is done on representative portions divided down from the cleaned sample, using a Boemer-type divider.

When the grading factor is . . .	Then use . . .
Normal	Optimum portion size
Severe	Minimum portion size or more (do not use less)

Values in the following table represent a range of recommended portions.

Representative portion of fababeans for grading, grams

Grading factor	Minimum	Optimum	Export
Damage	100	250	250
Excreta	working sample	working sample	working sample
Fireburnt	500	working sample	working sample
Foreign material	100	500	500
Heated or rotted	100	250	500
Mouldy	100	250	500
Odour	working sample	working sample	working sample
Perforated	100	250	250
Sclerotinia	250	1000	1000
Splits	100	250	500
Stones	250	500	1000

Grading factors

Blackened Fababeans are blackened when their seed coats are very dark blue to black.
See *Damage*.

Representative portion for analysis

Minimum—100 g

Optimum—250 g

Export—250 g

**Colour
(CLR)**

Colour is evaluated on the cleaned sample after the removal of damaged and split fababeans.

Terms used to describe colour in the grade determinants tables

Term	Characteristics
Reasonably good natural colour	Fababeans are moderately immature, with lightly adhered soil, moderately discoloured from storage or other natural causes, such as mottling.
Fair colour	Fababeans are immature but not green, have moderate amounts of adhered soil, or are otherwise moderately discoloured from natural causes, such as mottling.
Poor colour	Fababeans have a dark discolouration covering less than half of the hull, where there is no penetration of the cotyledon.

Other terms used to describe colour

Term	Characteristics
Sunburned or oxidation	Fababeans have undergone normal discolouration of the seed coats during storage. The colour varies from light tan to brown to very dark brown, depending on the duration and conditions of storage.
Immature	Fababeans are normal size and greenish, but not distinctly green.

**Contaminated
grain**

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the “*Canada Grain Act*” as: “Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*.”

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Fababeans, Sample Condemned*.

Cracked (CRKD)	Fababeans with a discoloured exposed cotyledon are considered cracked. See <i>Damage</i> .		
Representative portion for analysis			
Minimum—100 g	Optimum—250 g	Export—250 g	
Cracked seed coats (CSDC)	Fababeans with cracked seed coats are considered sound if the halves of the kernels are held firmly together and the beans are not otherwise damaged.		
Representative portion for analysis			
Minimum—100 g	Optimum—250 g	Export—250 g	
Damage (DMG)	Damage includes <ul style="list-style-type: none">• Blackened or cracked• Sprouting• Distinct immaturity• Distinct deterioration or discolouration by weather or disease• Insect damage• Heat or mould damage• Any other damage that seriously affects appearance or quality		
Representative portion for analysis			
Minimum—100 g	Optimum—250 g	Export—250 g	
Discoloured (DCLR)	Fababeans are considered discoloured if the discolouration on the seed coat covers more than half the bean or when the discolouration penetrates the cotyledon. See <i>Damage</i> .		
Representative portion for analysis			
Minimum—100 g	Optimum—250 g	Export—250 g	
Procedures			
If the penetration of the discolouration is not obvious, cut the cotyledon crosswise in the discoloured area to determine the extent of the discolouration.			
Earth pellets	<ul style="list-style-type: none">• Hard earth pellets are pellets that do not crumble under light pressure. See <i>Stones</i>.• Soft earth pellets are pellets that crumble under light pressure. See <i>Soft earth pellets</i>.		
Ergot (ERG)	Ergot is a plant disease producing elongated fungus bodies with a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.		

Representative portion for analysis

Minimum—500 g

Optimum—1000 g

Export—1000 g

**Excreta
(EXCR)**

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

There is no tolerance for excreta in fababeans.

Representative portion for analysisMinimum—working
sampleOptimum—working
sampleExport—working
sample**Fertilizer
pellets
(FERT PLTS)**

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysisMinimum—working
sampleOptimum—working
sampleExport—working
sample**Procedures**

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Fababeans, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

**Fireburnt
(FBNT)**

Fireburnt fababeans are beans charred or scorched by fire. A cross-section of a fireburnt bean resembles charcoal with numerous air holes. The air holes result in a low weight bean which crumbles easily under pressure.

Representative portion for analysis

Minimum—500 g

Optimum—working
sampleExport—working
sample**Procedures**

Samples containing any fireburnt seeds are graded *Fababeans, Sample Canada Account Fireburnt*.

Foreign material (FM)

Foreign material is any material other than whole or split fababeans.

Representative portion for analysis

Minimum—100 g

Optimum—500 g

Export—500 g

Green (GR)

Fababeans that are distinctly green from immaturity are considered damaged. See *Damage*.

Representative portion for analysis

Minimum—100 g

Optimum—250 g

Export—250 g

Heated (HTD)

Fababeans are considered heated or rotted if they are materially discoloured as a result of heating or rotting. Seed coats appear dark brown to black. The cotyledon tissue of dissected beans appears tan or brown. See *Damage*.

Representative portion for analysis

Minimum—100 g

Optimum—250 g

Export—500 g

Mouldy (MLDY)

Fababeans are considered mouldy if they show clear evidence of mildew or mould.

Representative portion for analysis

Minimum—100 g

Optimum—250 g

Export—500 g

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

Representative portion for analysis

Minimum—working sample

Optimum—working sample

Export—working sample

If odour is the grade determinant and there is . . .	Then the grade is . . .
An excessive objectionable odour not associated with the quality of the grain, but not heated or fireburnt	<i>Fababeans, Sample CW/CE Account Odour</i>
An excessive heated odour	<i>Fababeans, Sample CW/CE Account Heated</i>
An excessive fireburnt odour	<i>Fababeans, Sample CW/CE Account Fireburnt</i>

Perforated (PERF)	Fababeans are considered perforated if they show clear evidence of hull perforations caused by insects or disease.		
Representative portion for analysis			
	Minimum—100 g	Optimum—250 g	Export—250 g
<hr/>			
Rime	White rime is the adhered lining of the seed pod.		
	<ul style="list-style-type: none">• Fababeans that are completely and densely covered with white rime are considered damaged. See <i>Damage</i>.• When the rime is sparse enough to expose the soundness of the bean, the bean is sound and the rime is considered in the general appearance of the sample.		
Representative portion for analysis			
	Minimum—100 g	Optimum—250 g	Export—250 g
<hr/>			
Rotted (ROT)	See <i>Heated</i> .		
<hr/>			
Sclerotinia sclerotiorum (SCL)	<i>Sclerotinia sclerotiorum</i> is a fungus producing hard masses of fungal tissue, called <i>sclerotia</i> . The sclerotia vary in size and shape, and have a dark black exterior, a pure white interior and a coarse surface texture.		
Representative portion for analysis			
	Minimum—250 g	Optimum—1000 g	Export—1000 g
<hr/>			
Soft earth pellets (SEP)	Soft earth pellets are pellets that crumble under light pressure—if they do not crumble, they are considered stones. These pellets can be		
	<ul style="list-style-type: none">• Earth and fertilizer pellets• Any non-toxic material of similar consistency		
Representative portion for analysis			
	Minimum—100 g	Optimum—500 g	Export—500 g
Procedures			
	<ul style="list-style-type: none">• Earth pellets may be removed as dockage. See <i>Normal cleaning procedures</i>.• If soft earth pellets are over 10.0% of the gross weight of the sample, they become a grading factor, included in the tolerance for <i>Foreign Material</i>.		
	<ol style="list-style-type: none">1. Return the pellets to the sample.2. Handpick soft earth pellets from a representative portion of the cleaned sample.3. If soft earth pellets are the grade determinant, grade the sample <i>Fababeans, Sample Canada Account Admixture</i>.		

**Splits
(SPLT)**

Splits include

- Halves or smaller pieces of fababeans
- Halves that are loosely held together by cracked seed coats
- Fababeans with cracked cotyledons, such as from artificial drying

Splits do not include fababeans that are otherwise damaged.

Representative portion for analysis

Minimum—100 g

Optimum—250 g

Export—500 g

**Sprouted
(SPTD)**

Fababeans in which the hull is parted over the area of the germ as a result of sprouting are considered damaged. See *Damage*.

Representative portion for analysis

Minimum—100 g

Optimum—250 g

Export—250 g

**Stones
(STNS)**

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Representative portion for analysis

Minimum—250 g

Optimum—500 g

Export—1000 g

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
 2. Determine stone concentration in the net sample.
- In western Canada samples of grain containing stones in excess of “basic grade” tolerances, up to 2.5% are graded *Fababeans, Rejected “basic grade” Account Stones*. The “basic grade” refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
 - In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Fababeans, Sample Canada Account Stones*.
 - In western and eastern Canada grain containing more than 2.5% stones is graded *Fababeans, Sample Salvage*.

Examples: Western Canada

Excerpt from grade determinant tables for
Fababeans, Canada

*Grade name	Stones %
No. 1 Canada	0.1
No. 2 Canada	0.2
No. 3 Canada	0.5

* Defined in the *Canada Grain Regulations*

Basic grade: *Fababeans, No. 2 Canada*

Reason for basic grade: 2.0% Damage

If the above sample contained	Grade in western Canada
0.4% stones	<i>Fababeans, Rejected No. 2 Canada Account Stones</i>
1.0% stones	<i>Fababeans, Rejected No. 2 Canada Account Stones</i>
3.0% stones	<i>Fababeans, Sample Salvage</i>

Examples: Eastern Canada

Excerpt from grade determinant tables for
Fababeans, Canada

*Grade name	Stones %
No. 1 Canada	0.1
No. 2 Canada	0.2
No. 3 Canada	0.5

* Defined in the *Canada Grain Regulations*

Basic grade: *Fababeans, No. 2 Canada*

Reason for basic grade: 2.0% Damage

If the above sample contained	Grade in eastern Canada
0.4% stones	<i>Fababeans, No. 3 Canada</i>
1.0% stones	<i>Fababeans, Sample Canada Account Stones</i>
3.0% stones	<i>Fababeans, Sample Salvage</i>

**Treated seed
and other
chemical
substances**
Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals—pink or red, canola—baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Fababeans, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction “*Suspected Contaminated Grain, Handling Procedures*” for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Varieties

Fababeans are graded without reference to variety.

Primary grade determinants tables

Fababeans, Canada (CAN)

*Grade name	Standard of quality	*Splits %	Damage				Foreign material			
			Heated or rotted %	Mouldy %	*Perforated damage %	*Total %	Excreta %	Sclerotinia %	*Stones or shale %	*Total %
No. 1 Canada	*Degree of soundness Reasonably well matured, reasonably good natural colour	6.0	Nil	Nil	1.0	4.0	0.01	0.05	0.1	0.2
No. 2 Canada	Fairly well matured, fair colour	9.0	3K	6K	3.0	6.0	0.01	0.05	0.2	0.5
No. 3 Canada	Cool and sweet, excluded from higher grades on account of immaturity, poor colour or damage	12.0	1.0	2.0	3.0	10.0	0.01	0.05	0.5	2.0
Grade, if No. 3 specs not met		Fababeans, Sample Canada Account Splits	Fababeans, Sample Canada Account Heated	Fababeans, Sample Canada Account Mouldy Kernels	Fababeans, Sample Canada Account Damaged	Fababeans, Sample Canada Account Damaged	Fababeans, Sample Canada Account Excreta	Fababeans, Sample Canada Account Admixture	2.5% or less—Fababeans, Rejected (grade) Account Stones or Fababeans, Sample Canada Account Stones Over 2.5%—Fababeans, Sample Salvage	Fababeans, Sample Canada Account Admixture

* Defined in the *Canada Grain Regulations* Schedule III Table XXIX

K Number of kernel-sized pieces in 500 g

Export shipments

Shipments can be commercially clean or not commercially clean.

Commercially clean

Dockage is not reported for commercially clean shipments.

A deduction for finely broken fababeans removed by the No. 8 slotted sieve as dockage is allowed

- On shipments not for direct export, of up to 0.75%
- On shipments for direct export, of up to 1.0%

Definition of commercial cleanliness, Fababeans

Grade name	Foreign material	
	Material passing through No. 8 slotted sieve, including handpicked material %	Total %
No. 1 Canada	0.1	0.2
No. 2 Canada	0.1	0.2
No. 3 Canada	0.1	0.2

Not commercially clean (NCC)

Shipments that do not meet the standards for commercial cleanliness are referred to as not commercially clean. Such shipments are permitted only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal and transfer elevators, dockage is reported to the nearest nearest 0.1%, less a direct deduction of up to 0.2% to take into account the buildup of attritional material.

Grading

Where no export standards exist, fababeans on export are graded in accordance with primary grade standards.

Export grade determinants tables**Fababeans, Canada (CAN)**

Grade name	Foreign material	
	Sclerotinia %	Total %
No. 1 Canada	0.05	0.2
No. 2 Canada	0.05	0.5
No. 3 Canada	0.05	2.0

22. Chick peas

Determination of dockage	22-2
Definitions	22-2
Dockage not reported	22-2
Normal cleaning procedures	22-2
Composition of dockage	22-2
Optional analysis	22-2
Grading	22-4
Important definitions	22-4
Net weight of sample	22-4
Hazardous substances in samples	22-4
Representative portion for grading	22-4
Grading factors	22-5
Classes	22-5
Colour	22-5
Contaminated grain	22-5
Damage	22-5
Earth pellets	22-6
Ergot	22-6
Excreta	22-6
Fertilizer pellets	22-6
Fireburnt	22-6
Foreign material	22-7
Green	22-7
Heated	22-7
Insect damage	22-7
Mechanical damage including splits	22-7
Odour	22-8
Sclerotinia sclerotiorum	22-8
Soft earth pellets	22-8
Stones	22-8
Treated seed and other chemical substances	22-8
Primary and export grade determinants	22-10
Chick peas, Canada Western Kabuli (CW)	22-10
Chick peas, Canada Western Desi (CW)	22-11
Export shipments	22-12

Determination of dockage

Definitions

Dockage is assessed and recorded to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as "any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain." Dockage is removed by following the cleaning procedures described in this section of the guide.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the gross weight of the sample. Dockage is assessed on the gross weight of the sample.

Dockage not reported

▲ **Important:** Dockage is not reported for samples grading

- *Chick Peas, Sample CW (class) Account Fireburnt*
- *Chick Peas, Sample Salvage*
- *Chick Peas, Sample Condemned*

Normal cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

Dockage is assessed only on unprocessed samples of chick peas. All foreign material in processed samples is assessed as grading factors.

1. Using a Boerner type divider, divide the sample to obtain a representative portion of not less than 900 grams.
2. Choose the appropriate hand sieve for the class of chick peas:
 - **Kabuli:** No. 18 round-hole sieve (large seeded)
No. 12 slotted sieve (medium seeded)
 - **Desi:** No. 12 slotted sieve
3. Sieve the sample, using approximately 250 grams at a time, over the appropriate sieve to remove all readily removable material.
4. Handpick the portion remaining on top of the sieve to remove all course foreign vegetable matter such as pods, stems, straw, thistle tops.

Composition of dockage

All material removed by sieving or handpicking or both, as defined in *Normal cleaning procedures*.

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal or transfer elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported and elevator stocks will be adjusted on the basis of the analysis. Agreement of the shipper and unload elevator must be conveyed to the CGC in writing prior to the analysis being performed.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
 - The percentage by gross weight to the nearest 0.1% and the grade of chick peas.
 - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
 - The percentage of dockage.

Example

95.0% Chick Peas, No. 1 CW Desi

4.0% Domestic Mustard Seed, No. 1 CAN Oriental

1.0% dockage

Grading

Important definitions

Net weight of sample	The sample after cleaning and removal of dockage is called the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the cleaned sample, or the net weight.
Hazardous substances in samples	Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide or desiccant."

Representative portion for grading

All grading is done on representative portions divided down from the cleaned sample, using a Boerner-type divider.

When concentration of the grading factor is ...	Then use ...
Low	Optimum portion size
High	Minimum portion size or more (do not use less)

Values in the table represent a range of recommended portion sizes.

Representative portion of chick peas for grading, grams

Grading factor	Minimum	Optimum	Export
Colour	working sample	working sample	working sample
Damage	50	100	100
Foreign material	100	250	500
Green	50	100	100
Mechanical damage including splits	50	100	100
Odour	working sample	working sample	working sample

Grading factors

Classes There are two classes of chick peas, Kabuli and Desi. The class forms part of the grade name.

Colour (CLR) Colour is a grade determinant only in the Kabuli class. Colour is assessed after the removal of damaged chick peas and chick peas assessed as green. See *Damaged* and *Green*.

If chick peas are ...	Colour is ...
Sound, well matured and have a uniform normal colour	Good
Immature, but not green, have moderate amounts of adered soil, are lightly stained but otherwise moderately discoloured from natural causes	Fair
Do not meet the definition of fair colour	Poor

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the “*Canada Grain Act*” as: “Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*.”

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Chick Peas, Sample Condemned*.

Damage (DMG)

Damaged chick peas include

- Whole or broken chick peas that are sprouted, frost damaged, heated, damaged by insects, distinctly deteriorated or discoloured by weather or by disease, or that are otherwise damaged in a way that seriously affects their quality.

In Kabuli chick peas, white and shrivelled chick peas and yellow or water stained chick peas should be cut and examined for damage. If the cotyledons show

- Any signs of visible damage, they are considered damaged
- No signs of visible damage, they are considered in the evaluation of colour

Representative portion for analysis

Minimum—50 g

Optimum—100 g

Export—100 g

**Earth pellets
(EP)***See Foreign material.***Ergot
(ERG)***See Foreign material.***Excreta
(EXCR)****▲ Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.*See Foreign material.***Fertilizer
pellets
(FERT PLTS)**

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysisMinimum—working
sampleOptimum—working
sampleExport—working
sample**Procedures**

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Chick Peas, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction “*Suspect Contaminated Grain, Handling Procedures*” for procedures to be followed when handling samples containing fertilizer pellets.

**Fireburnt
(FBNT)**

Fireburnt seeds have been charred or scorched by fire. No fireburnt seeds are allowed in chick peas.

Procedure

Samples considered fireburnt are graded *Chick Peas, Sample CW (class) Account Fireburnt*.

Foreign material (FM)	<p>Foreign material includes</p> <ul style="list-style-type: none"> • Other classes of chick peas • Other grains and seeds • Ergot and sclerotinia • Mineral matter, stones and earth pellets • Excreta • Any other material not removed by <i>Normal cleaning procedures</i> <p>Representative portion for analysis</p> <p>Minimum—100 g Optimum—250 g Export—500 g</p>
Green (GR)	<p>Chick peas may be considered green regardless of the cause.</p> <p>Frost-damaged chick peas which are green are considered under the grade determinant for <i>Green</i>.</p> <p>Frost-damaged chick peas with no green colour are considered under the grade determinant for <i>Damage</i>.</p> <p>Kabuli chick peas are considered green if they show any green colour of any size area anywhere on the seeds or seed coats.</p> <p>Desi chick peas are considered green if they show distinctly green colour throughout the seed when cut to expose the cotyledons.</p> <p>Representative portion for analysis</p> <p>Minimum—50 g Optimum—100 g Export—100 g</p>
Heated (HTD)	<p>Chick peas that have dull seed coats and discoloured cotyledons ranging from light tan to dark brown are considered heated. See <i>Damage</i>.</p>
Insect damage (I DMG)	<p>See <i>Damage</i>.</p>
Mechanical damage including splits (MDMGINC-SPLTS)	<p>In chick peas, mechanical damage including splits includes</p> <ul style="list-style-type: none"> • Whole chick peas with more than 10% of the chick pea broken off • Split chick peas <p>▲ Important: Seeds with hairline cracks and chipped seed coats are not considered mechanical damage.</p> <p>Representative portion for analysis</p> <p>Minimum—50 g Optimum—100 g Export—100 g</p> <p>Procedures</p> <p>Chick peas with mechanical damage are hand-picked.</p>

**Odour
(ODOR)**

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

If odour is the grade determinant and there is . . .	Then the grade is . . .
A distinct objectionable odour not associated with the quality of the grain, but not heated or fireburnt	<i>Chick Peas, Sample CW (class) Account Odour</i>
A distinct heated odour	<i>Chick Peas, Sample CW (class) Account Heated</i>
A distinct fireburnt odour	<i>Chick Peas, Sample CW (class) Account Fireburnt</i>

**Sclerotinia
sclerotiorum
(SCL)**

See Foreign material.

**Soft earth
pellets
(SEP)**

See Foreign material.

**Stones
(STNS)**

See Foreign material.

**Treated seed
and other
chemical
substances****Treated seed**

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals—pink or red, canola—baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Chick Peas, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction “*Suspected Contaminated Grain, Handling Procedures*” for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Primary and export grade determinants tables

Chick Peas, Canada Western Kabuli (CW)

*Grade name	Standard of quality		*Damage %	*Mechanical damage including splits %	*Green %	*Foreign material %
	*Colour					
No. 1 CW	Good, natural colour		0.5	1.0	0.5	0.1
No. 2 CW	Fair		1.0	2.0	1.0	0.2
No. 3 CW	Poor		2.0	3.0	2.0	0.2
Grade, if No. 3 specs not met	Chick Peas, Sample CW Kabuli Account Colour		Chick Peas, Sample CW Kabuli Account Damaged	Chick Peas, Sample CW Kabuli Account Mechanical Damage and Splits	Chick Peas, Sample CW Kabuli Account Green	Chick Peas, Sample CW Kabuli Account Foreign Material

* Defined in the Canada Grain Regulations Schedule III Table XXVII.2

Chick Peas, Canada Western Desi (CW)

*Grade name	*Damage %	*Mechanical damage including splits %	*Green %	*Foreign material %
No. 1 CW	1.0	2.0	1.0	0.1
No. 2 CW	2.0	3.5	2.0	0.2
No. 3 CW	3.0	5.0	3.0	0.2
Grade, if No. 3 specs not met	Chick Peas, Sample CW Desi Account Damaged	Chick Peas, Sample CW Desi Account Mechanical Damage and Splits	Chick Peas, Sample CW Desi Account Green	Chick Peas, Sample CW Desi Account Foreign Material

* Defined in the Canada Grain Regulations Schedule III Table XXVII.1

Export shipments

Chick peas on export are graded in accordance with primary grade standards and specifications. Foreign material in cleaned or processed peas is treated as a grading factor and not assessed as dockage. Cargoes containing dockage may not be shipped except with permission from the CGC.

23. Screenings

Composition of screenings	23-2
Whole grain in screenings	23-2
Canola, rapeseed or domestic mustard seed in screenings	23-3
Dockage	23-3
Grading factors	23-4
Ergot	23-4
Excreta	23-4
Heated, fireburnt and odour	23-4
Injurious seeds	23-4
Knuckles and straw	23-4
Mustard seed	23-4
Other domestic grains	23-4
Other large seeds	23-5
Sclerotinia sclerotiorum	23-5
Soft earth pellets	23-5
Stones	23-5
Other factors	23-5
By-products of a manufacturing process	23-5
Pelleted screenings	23-5
Cleaning screenings	23-6
Feed screenings	23-6
Uncleaned screenings	23-6
Refuse screenings	23-6
Notation as to kind	23-6
Grade determinants tables	23-7
No. 1 Feed Screenings	23-7
No. 2 Feed Screenings	23-8
Mixed Feed Oats	23-9
Cleaning	23-9
Composition	23-9

Composition of screenings

Screenings consist of dockage material that qualifies only for Class IV grades. Screenings are graded in accordance with the specifications in the *Off-grades of Grain and Grades of Screenings* order.

Show the composition of screenings in detail on all records for carlots and cargoes. The composition determines the market value of the screenings.

Whole grain in screenings

Whole grain in screenings includes wheat, rye, barley, oats, triticale, flaxseed, rapeseed, canola, domestic mustard seed and pulses.

At a terminal, process, or transfer elevator, show the percentage by weight and the grade of whole grain in screenings on all inspection records and grade certificates and as part of the grade name, if

- Shipments contain 6.0% or over by weight of whole grain which can be separated by the usual cleaning methods
- The grain qualifies for an official, special or off-grade

For example,

Grade: <i>Refuse Screenings, less 15.0% Wheat, CW/CE Feed</i>	
Composition	10.0% chaff
	15.0% Wheat CW/CE Feed
	8.0% large seeds
	67.0% small seeds and dust
Total	100.0%

Report the percentage by weight and the kinds of whole grain in the sample for samples representing shipments from primary elevators or unlicensed warehouses to destinations other than terminal or transfer elevators.

For example,

Grade: <i>Refuse Screenings, less 15.0% Wheat</i>	
Composition	10.0% chaff
	15.0% Wheat
	8.0% large seeds
	67.0% small seeds and dust
Total	100.0%

**Canola,
rapeseed or
domestic
mustard seed
in screenings**

Record the percentage by weight of whole seeds of small oilseeds, canola, rapeseed or domestic mustard seed, that can be separated from samples of screenings by approved sieves.

Include small, shrivelled or broken seeds which pass through the slotted sieve in the total percentage by weight of small seeds and dust.

Dockage

Dockage is not assessed for screenings except for *Mixed Feed Oats*.

Grading factors

Ergot (ERG)

Ergot is a disease that attacks cereal grains and results in a fungus growth in place of the kernel of grain. The disease produces elongated fungal bodies that have a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.

Excreta (EXCR)

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Heated, fireburnt and odour (HTD, FBNT, ODOR)

Screenings that are not sweet are graded according to their composition with the condition included in the grade name.

If odour is the grade determinant and there is . . .	Then the grade is . . .
An excessive objectionable odour not associated with the quality of the grain, but not heated or fireburnt	<i>Screenings, (Grade Name) Account Odour</i>
An excessive heated odour	<i>Screenings, (Grade Name) Account Heated</i>
An excessive fireburnt odour	<i>Screenings, (Grade Name) Account Fireburnt</i>

Injurious seeds

The following seeds are designated by the Feeds Regulations as detrimental to animal health:

bird rape	cockle, cow
cockle, purple	darnel
false flax, flat-seeded	false flax, small-seeded
false flax, western (large seeded)	mustard, black
mustard, Indian	mustard, hare's ear
mustard, tumble	mustard, wild
mustard, wormseed	stinkweed

Knuckles and straw, (KNKLS STRAW)

Knuckles include empty wheat heads, nodes of stems and short pieces of straw up to approximately 2.5 cm in length.

Mustard seed (MUS)

Common wild mustard and hare's ear mustard seed are designated as injurious in the Canada Feed Regulations.

Other domestic grains

Other domestic grains are any grains other than wheat, rye, barley, oats, triticale, flaxseed, solin, rapeseed, canola, domestic mustard seed and pulses.

Other large seeds (OLSDS)	Other large seeds are seeds not designated as injurious in the Canada Feed Regulations. They include lady's thumb and pale smartweed.
Sclerotinia sclerotiorum (SCL)	<i>Sclerotinia sclerotiorum</i> is a fungus producing hard masses of fungal tissue, called <i>sclerotia</i> . The sclerotia vary in size and shape, and have a dark black exterior, a pure white interior, and a coarse surface texture.
Soft earth pellets (SEP)	Soft earth pellets include soft fertilizer pellets and any other non-toxic material of a similar consistency.
Stones (STNS)	Stones include hard shale, coal, hard earth pellets, fertilizer pellets and other non-toxic materials of similar consistency.

Other factors

By-products of a manufacturing process

By-products of a manufacturing process are materials such as malt sprouts, oat hulls, ground and pelleted material. They do not qualify as grain screenings.

If inspection is requested on material that is wholly or partly processed grain screenings, it is graded *Sample* according to the dominant product, for example, *Sample Malt Sprouts*, *Sample Screenings*, *Ground*; *Sample Oat Hulls*.

Pelleted screenings

When official weighing or inspection of pellets made from Canadian grain screenings is requested, the official description is *Canadian ground and pelleted screenings*.

At the request of a shipper, you may show the prime source of screenings in parentheses following the description, for example, *Canadian ground and pelleted screenings (flaxseed)*.

If you are in doubt about the source, you may request a letter of certification from the shipper certifying the source of the screenings. Shippers may also request to have the word *grain* included in the description of the pellets, for example, *Canadian ground and pelleted grain screenings*.

Pellets received into terminal elevators made from processing residues of agricultural products are described as simply as possible, for example, *Canadian canola extraction pellets*, *Canadian wheat bran pellets*, *Canadian beet pulp pellets*. You must be reasonably certain of the source or country of origin.

Cleaning screenings

Feed**screenings**

1. Divide a representative portion of approximately 500 g from the sample.
2. Sift the portion over the No. 4.5 round-hole sieve to assess the percentage of small weed seeds, chaff, hulls, dust, etc.
3. Handpick a representative portion of at least 10 g to determine the components of the sample.
4. Show the composition in detail in all records and endorse the backs of certificates.

Uncleaned screenings

Uncleaned screenings do not meet the specifications for No. 1 or No. 2 Feed screenings because of their content of weed seeds, hulls, chaff or dust. Uncleaned screenings must contain at least 35.0% of material that if separated would meet the grade requirements for No. 1 Feed screenings.

1. Divide a representative portion of not less than 750 g from the uncleaned sample.
2. Sift the portion over the No. 4.5 round-hole sieve to assess the percentage by weight of small weed seeds and dust.
3. Handpick a representative portion not less than 10 g to determine the components of the sample.
4. Show the composition of the sample in detail on all records and endorse the backs of certificates.

Refuse screenings

Refuse screenings do not meet the grade requirements for *Uncleaned screenings* because of their content of weed seeds, chaff or dust.

1. Divide a representative portion of not less than 250 g from the uncleaned sample.
2. Sift the representative portion over the No. 5 buckwheat and the No. 4.5 round-hole sieves nested to determine the percentage by weight of seeds.
3. Class as large seeds those that pass through the No. 5 buckwheat sieve but remain on top of the No. 4.5 round-hole.
4. Class as small seeds material that passes through the No. 4.5 round-hole sieve.
5. Handpick a representative portion of at least 25 g of the material remaining on top of the 5 buckwheat sieve.

Notation as to kind

When no written request is received for a notation as to kind, such a notation is entered on the records only and it is stated that the notation does not appear on the certificate, for example, *Canola—not shown on certificate*.

Grade determinants tables

No. 1 Feed Screenings

Grade name	Standard of quality	Minimum quantity of shrunken or broken grain %	Maximum tolerances, including canola, rapeseed, wild and domestic mustard seed					
			Hare's ear or wild mustard seed %	Maximum tolerances, including weed seeds which pass through a No. 4.5 round-hole sieve, chaff, dust				
				Hulls %	Soft earth pellets %	Knuckles and straw		Total %
No. 1 Feed Screenings	Must be cool and sweet	35.0	2.0	1.0	1.0	Straw %	Total %	Total %
Uncleaned	No requirements	12.5	-	-	3.0	0.25	3.0	3.0
Refuse	No requirements	Nil	-	-	3.0	5.0	5.0	-
Grade, if specs not met	No. 1 Feed Screenings, Account Heated, or Fireburnt, or Odour				Sample Screenings, Account Soft Earth Pellets	-	-	-

Grade name	Ergot %	Excreta %	Injurious seeds		Other domestic grains %	Other large seeds %	Sclerotinia %	Stones %	Wild buckwheat %	Wild oats %	Wild oat hulls %
			Other than hare's ear or wild mustard seed %	Total %							
No. 1 Feed Screenings	0.1	0.02	1.0	2.0	Nil	10.0	0.25	0.3	65.0	8.0	Nil
Uncleaned	0.1	0.1	-	-	10.0		0.25	0.5			1.0
Refuse	0.1	0.1			10.0		0.25	0.5			-
Grade, if specs not met	(Grade name) Screenings, Ergot	Sample Screenings, Account Excreta			Sample Screenings, with composition in remarks	No. 2 Feed Screenings	Sample Screenings, Account Sclerotinia	Sample Screenings, Account Stones		See Mixed feed oats	

No. 2 Feed Screenings

Grade name	Standard of quality	Minimum quantity of shrunken or broken grain %	Maximum tolerances, including canola, rapeseed, wild and domestic mustard seed					
			Hare's ear or wild mustard seed %	Maximum tolerances, including weed seeds which pass through a No. 4.5 round-hole sieve, chaff, dust				
				Hulls %	Soft earth pellets %	Knuckles and straw		Total %
No. 2 Feed Screenings	Must be cool and sweet	35.0	2.0	1.0	1.0	Straw %	Total %	3.0
Uncleaned	No requirements	12.5	-	-	3.0	5.0	5.0	-
Refuse	No requirements	Nil			3.0	-	-	
Grade, if specs not met	No. 2 Feed Screenings, Account Heated, or Fireburnt, or Odour				Sample Screenings, Account Soft Earth Pellets			

Grade name	Ergot %	Excreta %	Injurious seeds		Other domestic grains %	Other large seeds %	Sclerotinia %	Stones %	Wild buckwheat %	Wild oats %	Wild oat hulls %
			Other than hare's ear or wild mustard seed %	Total %							
No. 2 Feed Screenings	0.1	0.02	1.0	2.0	5.0	-	0.25	0.3	-	49.0	Nil
Uncleaned	0.1	0.1	-	-	10.0		0.25	0.5			1.0
Refuse	0.1	0.1			10.0		0.25	0.5			-
Grade, if specs not met	(Grade name) Screenings, Ergoly	Sample Screenings, Account Excreta			Sample Screenings, with composition in remarks		Sample Screenings, Account Sclerotinia	Sample Screenings, Account Stones		See Mixed feed oats	

Mixed Feed Oats

Cleaning

1. Divide a representative portion of at least 750 g from the uncleaned sample.
2. Sift the representative portion over the No. 4.5 round-hole sieve to remove up to 1.0% by weight of small weed seeds, chaff and dust.

If more than 1.0% of small seeds, chaff and dust passes through the No. 4.5 round hole sieve,

1. Assess dockage.
 2. Record dockage to the nearest 0.1%.
3. Handpick soft earth pellets from the cleaned sample.
 - For samples containing up to 10.0% by weight of soft earth pellets, assess earth pellets as dockage.
 - For samples containing over 10.0% soft earth pellets by weight, grade *Sample Screenings, Account Earth Pellets*.
 4. Show the composition in detail on all records for carlots and cargoes.

Composition

Samples must contain at least 50.0% by weight of wild oats.

Grade name	Material through No. 4.5 round-hole sieve %	Wild buckwheat, wheat heads, knuckles, straw and chaff			
		Knuckles, straw and chaff %	Wheat heads %	Wild buckwheat %	Total %
Mixed Feed Oats	1.0	4.0	5.0	5.0	5.0
No. 2 Mixed Feed Oats	1.0	4.0	5.0	5.0	10.0
Grade, if No. 2 specs not met	Report as dockage to the nearest 0.5%				

Grade name	Ergot %	Excreta %	Flaxseed %	Heated %	Other domestic grains %	Sclerotinia %	Stones %
Mixed Feed Oats	0.25	0.02	5.0	5.0	5.0	0.25	0.1
No. 2 Mixed Feed Oats	0.33	0.02	5.0	10.0	5.0	0.25	0.2
Grade, if No. 2 specs not met	<i>Mixed Feed Oats, Ergot</i>	<i>Mixed Feed Oats, Excreta</i>		<i>Mixed Feed Oats, Heated</i>		<i>Sample Screenings Account Sclerotinia</i>	<i>Sample Screenings Account Stones</i>

24. Experimental grades of wheat and barley

Criteria for designation as experimental grades	24-2
Wheat	24-3
Classes and varieties	24-3
Cleaning	24-3
Grading factors	24-3
Contaminated grain	24-3
Degermed	24-3
Fertilizer pellets	24-3
Grass green	24-4
Hard vitreous kernels	24-4
Insect damage	24-4
Stones	24-4
Treated seed and other chemical substances	24-5
Primary grade determinants tables	24-7
Wheat, Canada Western Experimental (CW EXPRMTL)	24-7
Barley	24-9
Cleaning and determination of dockage	24-9
Grading factors	24-9
Contaminated grain	24-9
Fertilizer pellets	24-9
Large oil-bearing seeds such as sunflower and soybean	24-10
Matter other than cereal grains	24-10
Soft earth pellets	24-10
Stones	24-11
Treated seed and other chemical substances	24-12
Primary grade determinants tables	24-13
Barley, Canada Western Experimental (CW EXPRMTL)	24-13

Criteria for designation as experimental grades

Experimental grades for selected varieties of wheat and barley have been established to allow the Canadian Wheat Board to market test varieties that do not readily fit into the existing grade structure, but which show some promise for acceptability in world markets.

A variety is eligible to be assigned to the grades defined in the experimental grade schedules only if the variety is designated by one of

- Agriculture and Agri-Food Canada
- Canadian Wheat Board
- Canadian Grain Commission

The criteria for a variety to be eligible for designation are

- There is evidence that Canadian producers will derive a benefit from its production either immediately or in the future.
- There is supportive data for its agronomic characteristics and end-use quality.
- The variety will be produced under contract to the Canadian Wheat Board.
- The variety will remain in the program for a specified period.

When a variety is no longer eligible for the experimental grades, the Canadian Wheat Board purchases and disposes of all existing stocks to prevent adulteration of registered varieties, unless the Canadian Grain Commission establishes a grade schedule for that variety and any other varieties of that grain having similar qualities.

Wheat

Classes and varieties

A variety from any class of wheat may be approved for eligibility for experimental grades. The class of wheat is noted in the remarks on inspection records.

Samples containing admixtures of registered Canadian or foreign varieties in excess of 5.0% by weight are graded *Canada Western Feed*.

Cleaning

- Dockage is assessed using the procedures described in Chapter 4 of this Guide.
- All special cleaning described in Chapter 4 is applied to experimental grades, provided that the grade can be improved.

Grading factors

Samples eligible for experimental grades but displaying grading factors other than stones that are above established tolerances are graded *Canada Western Feed* or *Sample* depending on the severity of the grading factors.

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the "Canada Grain Act" as: "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Wheat, Sample Condemned*.

Degermed

Tolerances apply to kernels not classed as sprouted.

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Wheat, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

Grass green	Tolerances are only a guide. Consider the overall quality of the sample.
Hard vitreous kernels	Vitreousness is the natural translucent colouring that is a visible sign of kernel hardness. It is a factor for hard wheat varieties only. For a full description, see Chapter 4.
Insect damage	Consider the overall quality of the sample.
Stones (STNS)	Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See <i>Fertilizer pellets</i> for specific procedures to be followed when samples contain fertilizer pellets.)

Representative portion for analysis

Minimum—500 g

Optimum—1000 g

Export—1000 g

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

Note: Stones may be removed and included in dockage if the the material removed is 5.0% or less of the gross weight of the sample. See *Cleaning for grade improvement*.

- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Wheat, Rejected "basic grade" Account Stones*. The "basic grade" refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In western and eastern Canada grain containing more than 2.5% stones is graded *Wheat, Sample Salvage*.

Examples: Western Canada

Excerpt from grade determinant tables for
Wheat, Canada Western Experimental

*Grade name	Stones %
No. 1 CW EXPRMTL	0.03
No. 2 CW EXPRMTL	0.03
No. 3 CW EXPRMTL	0.06
CW Feed	0.10

*Defined in the *Canada Grain Regulations*

Basic grade: *Wheat, No. 3 Experimental*

Reason for basic grade: *Mildew*

If the above sample contained	Grade in Western Canada
0.08% stones	<i>Wheat, Rejected No. 3 CW Experimental Account Stones</i>
3.0% stones	<i>Wheat, Sample Salvage</i>

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments for cereals is pink or red and for canola is baby blue, white and green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

Procedures

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Wheat, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspected Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Primary grade determinants tables

Wheat, Canada Western Experimental (CW EXPRMTL)

*Grade name	Standard of quality				Foreign material						Wheats of other classes or varieties	
	*Minimum test weight kg/hL (g/0.5 L)	*Variety	*Degree of soundness	*Minimum hard vitreous kernels %	Ergot %	Excreta %	*Matter other than cereal grains %	Sclerotinia %	Stones %	*Total %	*Contrasting classes %	*Total %
No. 1 CW EXPRMTL	79.0 (385)	Any variety of wheat designated by Agriculture and Agri-Food Canada for experimental purposes	Reasonably well matured, reasonably free from damaged kernels	65.0	0.01	0.01	0.2	0.01	0.03	0.4	0.5	1.5
No. 2 CW EXPRMTL	77.5 (378)		Fairly well matured, may be moderately bleached or frost-damaged, reasonably free from severely damaged kernels	35.0	0.02	0.01	0.2	0.02	0.03	0.75	1.5	3.0
No. 3 CW EXPRMTL	76.5 (373)		May be frost-damaged, immature or weather-damaged, moderately free from severely damaged kernels	-	0.04	0.015	0.2	0.04	0.06	1.25	2.5	5.0
CW Feed	65.0 (315)	Any type or variety of wheat excluding amber durum	Reasonably sweet, excluded from other grades of wheat on account of damaged kernels		0.10	0.03	1.0	0.10	0.10	10.0	No limit—but not more than 10.0% amber durum	
Grade, if specs for CW Feed not met	Wheat, Sample CW Account Light Weight				Wheat, Sample CW Account Ergot	Wheat, Sample CW Account Excreta	Wheat, Sample CW Account Admixture	Wheat, Sample CW Account	2.5% or less—Rejected (grade) Account Stones Over 2.5%—Wheat, Sample Salvage	See Mixed grain	Over 10.0% amber durum—Wheat, Sample CW Account Admixture	

* Defined in the Canada Grain Regulations Schedule III Table XLIII and Table V

Wheat, Canada Western Experimental (CW EXPRMTL), continued

*Grade name	Artificial stain, no residue %	Dark, immature %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Heated, binburnt, severely mildewed, rotted, mouldy
No. 1 CW EXPRMTL	Nil	1.0	4.0	Nil	0.25	0.75	1.0	0.05% including 1 binburnt kernel per 1000 g
No. 2 CW EXPRMTL	5K	2.5	7.0	Nil	1.0	2.0	3.0	0.4% including 4 binburnt kernels per 1000 g
No. 3 CW EXPRMTL	10K	10.0	13.0	Nil	2.0	10.0	8.0	1.0% including 6 binburnt kernels per 1000 g
CW Feed	2.0	-	-	2.0	5.0	-	-	2.5% including 2.5% binburnt kernels
Grade, if specs for CW Feed not met	Wheat, Sample CW Account Stained Kernels			Wheat, Sample CW Account Fireburnt	Over 5.0%—Wheat, Sample CW Account Fusarium Damage Over 10.0%—Wheat, Commercial Salvage			Wheat, Sample CW Account Heated

*Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken and broken			Smudge and blackpoint		Sprouted	
				Shrunken %	Broken %	Total %	Smudge %	Total %	Severely sprouted %	Total %
No. 1 CW EXPRMTL	0.5	1.5	2.0	4.0	5.0	7.0	30K	10.0	0.1	0.5
No. 2 CW EXPRMTL	2.0	5.0	5.0	4.0	6.0	8.0	1.0	20.0		1.5
No. 3 CW EXPRMTL	5.0	10.0	10.0	4.0	7.0	9.0	5.0	35.0		5.0
CW Feed	-	-	-	4.0	13.0	15.0	-	-	-	-
Grade, if specs for CW Feed not met				Sample Broken Grain						

* Defined in the Canada Grain Regulations Schedule III Table XLIII and Table V

K Number of kernel-sized pieces in 500 g

Barley

Experimental grades of barley eligible for sample grades are graded with reference to Canada Western. The term Experimental is removed from the grade name. For example, *Barley, Sample CW, Account Heated*.

Cleaning and determination of dockage

- Dockage is assessed using the procedures described in Chapter 6 of this Guide.
- All special cleaning described in Chapter 6 is applied to experimental grades, provided that the grade can be improved.

Grading factors

Normal grading factors for barley apply to experimental grade of barley.

Samples eligible for experimental grades but displaying grading factors other than stones over established tolerances are graded *General Purpose* or *Sample*, depending on the severity of the factors.

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the "Canada Grain Act" as: "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections F 01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Barley, Sample Condemned*.

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Wheat, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction “*Suspect Contaminated Grain, Handling Procedures*” for procedures to be followed when handling samples containing fertilizer pellets.

Large oil-bearing seeds such as sunflower and soybean

To grade samples containing any large oil-bearing seeds such as sunflower seeds and soybeans, use the grade schedule for General Purpose barley.

Grade	Percentage allowed
No. 1 CW	nil
No. 2 CW	nil

Matter other than cereal grains (MOTCG)

To grade samples containing more than the allowed percentages of *Matter other than cereal grains*, excluding large oil-bearing seeds, use the grade schedule for General Purpose barley, or grade Sample.

Grade	Percentage allowed
No. 1 CW	0.2
No. 2 CW	0.5

Soft earth pellets

Soft earth pellets are pellets that crumble under light pressure—if they do not crumble, they are considered stones. These pellets can be

- Earth and fertilizer pellets
- Any non-toxic material of similar consistency

Earth pellets may be removed as dockage.

If soft earth pellets are over 10.0% of the gross weight of the sample, they become a grading factor.

1. Return the pellets to the sample.
2. Handpick soft earth pellets from a representative portion of 100 g of the cleaned sample.
3. If soft earth pellets is the grade determinant, grade the sample *Barley, Sample CW Account Admixture*.

Export shipments of barley must be practically free of earth pellets.

**Stones
(STNS)**

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Representative portion for analysis

Minimum—500 g

Optimum—1000 g

Export—1000 g

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

Note: Stones may be removed and included in dockage if the the material removed is 5.0% or less of the gross weight of the sample. See *Cleaning for grade improvement*.

- In western Canada samples of grain containing stones in excess of “basic grade” tolerances, up to 2.5% are graded *Barley, Rejected “basic grade” Account Stones*. The “basic grade” refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In western and eastern Canada grain containing more than 2.5% stones is graded *Barley, Sample Salvage*.

Examples: Western Canada

Excerpt from grade determinant tables for
Barley, Canada Western Experimental

*Grade name	Stones
No. 1 CW EXPRMTL	1K
No. 2 CW EXPRMTL	2K

* Defined in the *Canada Grain Regulations*

K Number of kernel-sized pieces in 500 g

Basic grade: *Barley, No. 1 CW Experimental*

If the above sample contained	Grade in Western Canada
2K stones	<i>Barley, Rejected No. 1 CW Experimental Account Stones</i>
3.0% stones	<i>Barley, Sample Salvage</i>

**Treated seed
and other
chemical
substances**
Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments for cereals is pink or red and for canola is baby blue, white and green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Representative portion for analysis

Minimum—working
sample

Optimum—working
sample

Export—working
sample

Procedures

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Barley, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction “*Suspected Contaminated Grain, Handling Procedures*” for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Primary grade determinants tables

Barley, Canada Western Experimental (CW EXPRMTL)

*Grade name	Standard of quality				Foreign material						
	*Minimum test weight kg/hL (g/0.5L)	*Variety	*Minimum designated variety %	*Degree of soundness	Ergot %	*Inseparable seeds %	*Other cereal grains %	Sclerotinia %	Stones	*Wild oats %	*Total %
No. 1 CW EXPRMTL	62.0 (298)	Any variety designated by Agriculture and Agri-Food Canada for experimental purposes	95.0	Practically sound, reasonably well matured, may contain slightly weather-damaged but not badly stained or discoloured kernels	0.02	0.2	1.0	0.01	1K	0.5	1.0
No. 2 CW EXPRMTL	60.0 (288)		90.0	Reasonably sound, fairly well matured, may contain moderately weather-damaged but not severely discoloured kernels	0.05	0.2	3.0	0.01	2K	1.0	3.0
Grade, if No. 2 specs not met					General purpose barley or sample grades					25% or less— <i>Barley, Rejected (grade) Account Stones</i> Over 2.5%— <i>Barley, Sample Salvage</i>	General purpose barley or sample grades

*Grade name	Damage						
	Fireburnt %	Frost		Heated, rotted or severely mildewed %	Peeled and broken		Sprouted %
		Severe %	Total %		Primary %	Ex terminal %	
No. 1 CW EXPRMTL	Nil	0.2	5.0	Nil	4.0	5.0	Nil
No. 2 CW EXPRMTL	Nil	2.0	5.0	0.05	5.0	6.0	0.5
Grade, if No. 2 specs not met	General purpose barley or sample grades						

* Defined in the Canada Grain Regulations Schedule III Table XLIV

K Number of kernel-sized pieces in 500 g

25. Sample feed grain

Determination of dockage

Samples are graded using procedures for sample feed grain when they exceed the Broken tolerances for Mixed Grain.

▲ **Important:** When a sample is to be graded as sample feed grain,

1. Return dockage to the cleaned sample.
2. Begin cleaning and dockage assessment using the procedures described in this section.

Dockage is assessed to the nearest 0.1% on all samples.

Normal cleaning procedures

1. Use a No. 4.5 round-hole hand sieve.
2. Divide the uncleaned sample to obtain a representative portion not less than 750 grams.
3. Sift the representative portion over the No. 4.5 round-hole sieve.

Composition of dockage

Dockage contains

- Material that passes through the No. 4.5 round-hole sieve
- Material removed by special cleaning for grade improvement

Cleaning for grade improvement

If the grade of a sample can be improved by additional cleaning, perform the cleaning and add the additional material to dockage. Cleaning for grade improvement can be done at any time after normal cleaning.

1. Use a No. 6 or a No. 5 buckwheat hand sieve to remove large seeds. Large seeds are removed if their total weight exceeds 3.0% of the cleaned sample by weight.
2. Record the additional cleaning and dockage on inspection records.

Primary and export grade determinants tables

Sample feed grain

Grade name	Foreign material									
	Large material				Fusarium %	Flaxseed %	Excreta %	Soft earth pellets %	Sclerotinia %	Total large material and wild oats %
	Wheat heads %	Knuckles and straw %	Large weed seeds %	Total %						
Sample feed grain	0.33	10.0	5.0	4.0	10.0	4.0	3.0	10.0	0.25	49.0
	Sample (with components named)	Sample (with components named)	Sample (with components named if not removable with approved sieves)	Sample (with components named)	Sample (with components named)	Sample (with components named)	Sample (with components named)	Sample, Feed Grain, Soft Earth Pellets	Sample Feed Grain, Sclerotinia	Mixed Feed Oats
										Sample (with components named)

Large weed seeds includes other grains such as peas, corn, domestic buckwheat, etc.
 Samples containing over 3.0% by weight are graded. *Sample* and the components are named.
 Soft earth pellets are included in total of large seeds.

Grade name	Damage		
	Broken grain %	Fireburnt %	Heated %
	50.0	2.0	5.0
Sample feed grain	Sample Broken Grain (class on request)	Sample Feed Grain, Fireburnt	Sample Feed Grain, Heated

26. Standard abbreviations

The following standard abbreviations are used in inspection reports, official records and in conjunction with ISA, the Industry Services Automation program.

A

account	AC*
adhered hulls	ADHULLS
adhered soil	ADHS
admixture	ADMX
all rail	A/R
alternate grade	ALT GRD
amber durum	ADUR*
appears to be	ATB
approximately	APPROX
artificial stain	ART STND
aspiration	ASP
attrition	ATT
Azuki (Adzuki)	AZU*

B

barley	BLY*
barley of other classes	BOOC
barley of other types	BOOT
beans	BEN
binburnt	BBT*
black turtle	BKT*
blackeye	BKE
blackpoint	BLK PT
bleached	BLCH*
blue-eye mould	BEM
brake end	BE
bran pellets	BRAN PLTS
broken	BKN*
broken after cleaning	BKNA CL
broken deducted	BKN DED
broken grain	BKN GRN*
broken left	BKN LEFT
brown	BRN*
buckwheat	BWT*

An asterisk (*) beside a definition indicates that it is also defined in the Canada Grain Regulations.

26. Standard abbreviations

C

Canada	CAN*
Canada Eastern	CE*
Canada Prairie Spring	CAN PRIE SPG
Canada Western	CW*
canary seed	CNY SD*
canola	CNL*
canola meal	CNL MEAL
Century	CNTY*
cereal grain	C GRN
chaff	CHF
chlorophyll	CHLL
clover	CLV
cockle	COC
colour, colours	CLR*
composite	COMP
condemned	CNDM*
conspicuous admixture	CADMX
container	CONT
contrasting classes	CON CL*
contrasting colours	CON CLR
corn	CRN*
cow cockle	CCOC
cracked	CRKD
cracked corn	CC
cracked corn and foreign material	CC&FM*
cracked seed coat	CSDC*
cracked seed coats including splits	CSDC&SPLTS
cranberry	CBY*

D

damage	DMG
damaged	DMGD*
damage, foreign material and contrasting classes	DMGFMCONCL*
damp	DP*
damp extra	DP EX
damp sample	DP SPLE
dark green speckled	DGS
dark immature	DKIM
dark red kidney	DRK*
Dashaway	DSHY
deducted	DED
degermed	DGM
dehulled	DHULL
dehydrated	DEH
destination	DEST
destroyed	DST

An asterisk (*) beside a definition indicates that it is also defined in the Canada Grain Regulations.

different	DIFF
different classes combined	DCC*
different grades combined	DGC*
discoloured	DCLR
distinctly detrimental	DEET
distinctly green	DGR
dockage	DKG
domestic	DOM
downy mildew	DWNY MIL
Dutch brown	DBR*

E

earth pellets	EP*
eastern	E
elevator	ELEV
empty, clean and dry	ECD
ergot	ERG*
ergoty	ERGY*
excreta	EXCR*
experimental	EXPRMTL*
export ready	ER
extra	EX*
extra strong red spring	EXSTG RS

F

fababeans	FBN*
fair colour	FCLR
fairly good colour	FGCLR
fairly sound	FSND
fairly sweet	FST
feed	FD*
fertilizer	FERT
fertilizer pellets	FERT PLTS*
Finale	FNLE
fireburnt	FBNT*
flaxseed	FLX*
flax pellets	FLX PLTS
foreign material	FM*
foreign material excluding cereal	FMXCGRN
foreign material excluding cereal grains and wild oats	FMXCGRNWO
foreign material excluding other grains	FMXOG
foreign material excluding other cereal grains	FMXOCG
foreign material not grain	FMXGRN
frost	FR
frost light	FRL
frost severe	FRS
frost total	FRT

An asterisk (*) beside a definition indicates that it is also defined in the Canada Grain Regulations.

26. Standard abbreviations

fusarium damage	FUS DMG
fusarium mould	FUS MLD
G	
good natural colour	GNCLR
grade	GRD
grade improvement	GRDIMP
grain	GRN*
gram	g
grass-green	GRASS GR
grasshopper, army worm	GAW
Great Northern	GTN*
green	GR*
guaranteed	G
H	
handpick	HP
handpick coarse material	HPCURSMTL
handpick earth pellets	HP EP
handpick foreign material	HP FM
handpick hulled seed	HP HULL SD
handpick inseparable material	HP INSPMTL
handpick other grain	HP OG
handpick roughage	HP RHGE
handpick vegetable matter	HP VM
hard vitreous kernels	HVK
heated	HTD*
heated binburnt	HTDBBT
heavy	HVY
held	HLD*
hulled	HULL
hulled and broken	HULLBKN
hulls	HULLS
I	
identity preserved	IP*
immature	IM
inconspicuous admixture	INC ADMX
inert material	INERT MTL
Indianhead	INDNHD
inferior variety	INF VAR
insect damage	I DMG*
insect excreta	I EXCR
inseparable admixture	INSEPADMX
inseparable seeds	INSEP SDS
invisible loss	INV

An asterisk (*) beside a definition indicates that it is also defined in the Canada Grain Regulations.

K

kernels	KRNL
kilograms	kg
kilograms per hectolitre	kg/hL
knuckles	KNKLS*

L

lady's thumb	LTHMB
large seeds	LSDS
Lenca	LNCA*
lentils	LNT*
light	LT
light red kidney	LRK*
lightweight	LTWT

M

malt barley	MBL
malt pellets	MALT PLTS
maple	MAP*
material	MTL
matter other than cereal grains	MOTCG
mechanical damage including splits	MDMGINCSPLTS
midge	MDGE
mildew	MIL*
mildewed kernels	MIL KRNL*
millet	MLT*
mineral matter	MIN MAT
mineral matter including stones	MINMATINCSTNS
mixed	MXD*
mixed classes	MXD CL
mixed colours	MXD CLR*
mixed grain	MXG*
mixed types	MXD TYP
mixed varieties	MXD VAR
moderate weathering	MWEATH
moist	MT*
moist sample	MT SPLE
moisture test	MST
mouldy	MLDY
mouldy kernels	MLDY KRNL*
mustard seed	MUS
musty	MUSTY

N

natural stain	NSTN
net dockage	NET DKG
no brake end	NBE

An asterisk (*) beside a definition indicates that it is also defined in the Canada Grain Regulations.

26. Standard abbreviations

non-registered varieties	NON REGV
not commercially clean	NCC*
not of good natural colour	NGNCLR
not officially inspected	NOFFINSP
not ready for export	NRE
not reasonably sweet	NREASST
not uniform in size	NUS
not well screened	NWSCD
number	NO
numbers	NOS

O

oats	OAT
oat pellets	OAT PLTS
objectionable	OBJ
objectionable odour	OBJ ODOR
odd heated	ODD HTD
odour	ODOR*
off-colour	OFFCLR
oriental	ORIENT*
other	OTHER
other cereal grain	OCG
other cereal grain and other matter	OCGOM
other cereal grains excluding wheat	OCGXWHT
other classes	OCL
other classes of beans that blend	OCLBB*
other colours	OCLR
other conspicuous admixture	OCA
other damaged	ODMG
other distinctly detrimental seeds	ODDET
other grain	OG
other grains	OGS
other foreign material	OFM
other large seeds	OLSDS
other matter	OM
other than	OT
other varieties	OVAR
out of	EX

P

partition	PART
peabean	PBN*
peas	PEA
peas of other colours	POOCLR
peeled	PLD
peeled and broken	PLD BKN
peeled, split and broken	PLDSPLTBKN

An asterisk (*) beside a definition indicates that it is also defined in the Canada Grain Regulations.

pelleted	PLTD*
pelleted screenings	PLTD SCG
pellets	PLTS*
penetrated	PENT
penetrated smudge	PENT SM
perforated	PERF
pink	PNK*
pink kernels	PNK KRNL
pinto	PNT*
plump	PLMP
poor colour	PCLR
prairie	PRIE*
probe	P
protein	PROT
pulses other than green or yellow peas	PULSESOTGRORYELPEA

R

ragweed	RAG WD
rapeseed	RPE*
reasonably good colour	RGCLR
reasonably good natural colour	RGNCLR
reasonably sound	REASSND
red	R
red smudge	R SM
red spring	RS*
red winter	RW*
registered	REG
rejected	REJ*
riddle	RDLE
rotted	ROT
rotted kernels	ROT KRNL*
roughage	RHGE
rough awn	RAWN
round-hole	RH
rye	RYE
rye pellets	RYE PLTS

S

safflower	SAF
safflower seed	SAFF SD*
said to be	STB*
salvage	SLVG*
sample	SPL*
sample Canada	SPL CAN
sample feed grain	SFG*
sample spilt	SPL SPILT
sample too small	STS*

An asterisk (*) beside a definition indicates that it is also defined in the Canada Grain Regulations.

26. Standard abbreviations

sawfly	SFLY
Sclerotinia sclerotiorum	SCL*
screenings	SCG*
seed	SD*
seed coats	SDC
seeds	SDS
select	SEL*
separation	SEPN
severe midge damage	SEVMDGE
severely sprouted	SEVSPTD
shale	SHALE
shriveled	SHV*
shrunken	SHR
sieve	SVE
sieves	SIEVES
slotted	SLTD
six-row	6 ROW*
slightly stained	SSTND
small broken	SBKN
small red	SRD*
small seeds	SSDS
small seeds and dust	SSDS&DUST
smooth awn	SAWN
smudge	SM
smudge including blackpoint	SMINCBKPT
smudge total	TOT SM
smut	SMUT
smutty	SMTY
soft earth pellets	SEP
soft white	SW
soft white spring	SWS*
solin	SLN
sorghum	SRG*
soybeans	SYB*
special	SPEC*
special bin	SPEC BIN*
special cleaning	SCLN
special select	SPECSEL*
split	SPLT
splits, damage, foreign material and contrasting classes	SPDMGMCC*
spring	SPG*
sprouted	SPTD*
stained	STND
stained kernels	STND KRNL*
standard	STD
starchy	STCH
stones	STNS

An asterisk (*) beside a definition indicates that it is also defined in the Canada Grain Regulations.

straw	STRAW
strong	STG
submitted	S
sunflower	SUN
sunflower seeds	SUN SDS*
superficial discolouration	SUPDISCLR
T	
Tara	TARA
Tartarian buckwheat	TART BWT
test weight	TWT
thin	THIN
tombstone	TOMBST*
tonne	t
total	TOT
total adhered hulls	TOTADHLS
total broken	TBKN
total cockle and sclerotia	TCOCSCCL
total conspicuous admixture	TCA
total damage	TDMG
total distinctly detrimental	TDD
total foreign material	TFM
total foreign material including other cereal grains	TFMINCOG
total foreign material including sclerotia	TFMINCSCL
total including contrasting classes	TINCCONCL
total including damage, foreign material and contrasting classes	TINCDMGFMCONCL
total including inseparable seeds	TINCINSEPSDS
total including non-registered varieties	TINCNONREGVAR
total including splits, damage, foreign material and contrasting classes	TINCSPLTSDMGFMCONCL
total inseparable seeds	TINSEPSDS
total other cereal grain	TOCG
total other oilseeds and inseparable seeds	TOOSDSINSEPSDS
total removable material	TRMAT
total roughage	TOT RHGE
total shrunken and broken	TSHRBKN
total smudge	TOT SM
tough	TF*
trace	TR
trace heated	TR HTD
trailer	TRLR
Trapper	TRAP*
triticale	TCL*
Triumph	TRPH*
truck	TRCK (T with EIS)
two-row	2 ROW*

An asterisk (*) beside a definition indicates that it is also defined in the Canada Grain Regulations.

26. Standard abbreviations

U

unapproved variety	UNA VAR
United States of America	USA*

V

varietal purity not guaranteed	VPNG
variety	VAR*
vegetable matter	VM

W

warehouse	WHSE
weathered	WEATH
weight	WGT
western	W
wet	WT*
wet sample	WT SPLE
wheat	WHT*
wheat heads	WHT HDS
wheat of other classes	WOOC
white hilum	WHIL
white kidney	WKD*
white winter	WW*
wild buckwheat	W BWT
wild mustard	WM
wild mustard and canola/rapeseed	WM&CNL/RPE
wild mustard and rapeseed	WMRPE
wild oats	WO
winter	WIN

Y

yellow	YEL*
yelloweye	YLE*
yellow-seeded flax and solin	YELSDFLXSLN

An asterisk (*) beside a definition indicates that it is also defined in the Canada Grain Regulations.

27. Glossary

This section describes grading factors, procedures and common terms used in grading Canadian grain.

AAFC	Agriculture and Agri-Food Canada, the federal department of agriculture.
Act	Canada Grain Act. See Canada Grain Act.
aeration	Aeration is the process of passing air currents through a grain stream. This process is used to remove objectionable odours or to preserve grain quality by reducing its temperature or moisture content.
armyworm damage	See insect damage.
ascochyta blight	<p>Ascochyta blight is a fungal disease that attacks the leaflets, stems, petioles, pods, and seeds of lentil. Heavily infected seeds usually are characterized by a half-moon shaped, light to reddish or reddish brown spot on the edge of the seed. Occasionally it appears as a brown spot on the cheek of the seed.</p> <p>Ascochyta blight was first reported in Canada in 1978 and has subsequently become a serious problem. It causes yield losses and severe seed discolouration in epidemic years.</p>
attritional material	<p>Attritional material is dust, chaff and other material that builds up naturally in grain as it moves through the handling system.</p> <p>In wheat and other cereal grains, attritional material is removed on the Carter dockage tester set up with a 4.5 round-hole sieve.</p> <p>Shipments defined as commercially clean are allowed small amounts of attritional material.</p>
audit	<p>An audit is the official weighing and inspection of stocks of grain, grain products, or screenings in a licensed elevator, to determine if an overage or shortage of stock exists. Intervals between audits and limits for overages and shortages are prescribed in the Regulations.</p> <p>At licensed terminal and transfer elevators, audits are directed by CGC staff. At licensed primary and process elevators, operators need only to supply the CGC with stock reports.</p>

automatic mechanical sampler	An automatic mechanical sampler is a device which extracts a small representative portion from the grain flow at regular intervals.
average samples	Average samples represent the visual quality of a grade of grain in a specific location at the end of a time interval. Average samples are composited to create official carlot unload samples, cargo samples or submitted samples, by elevator, by port, or by inspection district. They provide a means of monitoring grade levels and specific grading factors.
barley of other types	In two-row barley, barley of other types is any six-row variety. In six-row barley, barley of other types is any two-row variety.
Berlese funnel	<p>A Berlese funnel is a device for collecting insects.</p> <p>Grain suspected of being infested is placed in the funnel. The funnels used by Industry Services hold up to one kilogram of grain. The funnels are placed under lights. Insects move away from the lights down the funnel and are collected in receptacles placed under the funnels.</p>
binburnt kernels	<p>Binburnt kernels closely resemble fireburnt kernels in colour. However, in cross section, the binburnt kernel maintains its dense structure and appears smooth and glossy, unlike a fireburnt kernel, which looks like charcoal in cross-section, has numerous air holes, and crumbles easily under pressure.</p> <p>Binburnt kernels are caused by gradual heating in storage and have not been exposed to temperatures approaching ignition.</p> <p>The weight of a binburnt kernel is similar to that of a sound kernel of comparable size.</p>
blackpoint	<p>Blackpoint is a discolouration on the germ end of kernels of grain caused by numerous species of fungi and bacteria. Blackpoint is found in barley, triticale and wheat, although there is no separate tolerance defined for blackpoint in barley.</p> <p>Kernels are susceptible during periods of rainfall or humidity above 90%, particularly during filling or maturation.</p> <p>Blackpoint does not usually reduce yields, but it can reduce grade and quality. Blackpoint is especially troublesome on durum wheat because black specks can appear in the semolina, making it undesirable for further processing.</p>

bleached	<p>Bleaching is an indication of exposure to wet conditions at or near maturity. Bleaching is caused by alternate wetting and drying of grain which causes tiny fissures to develop throughout the kernels. The fissures are caused because the grain swells a little when it is wet and doesn't dry back to the same size.</p> <p><i>See sprouted.</i></p>
-----------------	---

Board grain	<p>Board grains are western grains marketed under the control of the Canadian Wheat Board (CWB). These include western wheat and barley destined for the export market, as well as domestic sales of wheat and barley for human consumption.</p> <p>Domestic feed wheat and domestic feed barley may be sold either on the open market or delivered to the CWB.</p>
--------------------	---

brake end	<p>The brake end is the end of a railway car where the hand brake wheel is located. Compartments or partitions in a railcar are numbered sequentially beginning at the brake end.</p>
------------------	---

bunt	<p>Bunt is characterized the presence of bunt balls or black spores. Infected grain may have a fishy odour. Common bunt is a wheat disease caused by two closely related fungi, <i>Tilletia caries</i> and <i>Tilletia foetida</i>. The disease is also called stinking or covered smut. In infected plants, kernels on headed plants are replaced with bunt balls containing black powdery spores of the fungus.</p> <p>Bunt balls can be removed by following procedures for cleaning for grade improvement, as long as there is no odour. If there is an odour, the presence of bunt balls is a grading factor in wheat. If there is no odour, but kernels are tagged with bunt, the sample is considered naturally stained.</p> <p>Bunt reduces yield of infected crops, and it reduces the value of the crop, even in mildly infected crops. It is not as common as it once was in Canada, because we have developed effective control measures and new cultivars that are resistant to the disease.</p>
-------------	---

Canada Eastern, Canada Western, Canada	<p>These three terms form part of the grade name; for example, Canada Eastern White Spring wheat, or Canada Western select barley. The terms refer to the geographic area (eastern or western Canada) of production as defined in the Canada Grain Act, or to Canada generally.</p>
---	---

Canada Grain Act	<p>The Canada Grain Act is the statutory authority empowering the CGC to regulate grain handling in Canada and to establish and maintain quality standards for Canadian grain. It was first passed in 1912. The text of the Act can be found through the CGC web site at www.grainscanada.gc.ca.</p>
-----------------------------	--

Canada Grain Regulations	The Regulations are established by Section 116 of the Canada Grain Act. They govern grain-handling procedures and define grades for grain grown in eastern and western Canada.
canola	The term "canola" was trademarked in 1978 by the Western Canadian Oilseed Crushers' Association to differentiate the new superior low-erucic acid and low-glucosinolate varieties and their products from older rapeseed varieties.
cargo sample	A cargo sample is a composite of average samples taken as a cargo of wheat is loaded into a ship for export. Cargo samples are inspected and graded, and portions of them are sent to the Grain Research Laboratory for analysis.
caryopsis	The caryopsis is the kernel of cereal grains and grasses with the hull removed. See <i>groats</i> .
cash crops	Cash crops are crops produced for direct sale for cash.
cash purchase ticket	A cash purchase ticket is a ticket issued indicating the grade, weight, price and amount payable to the owner of the grain for each delivery of grain to a primary elevator, process elevator or grain dealer. The ticket is a negotiable instrument and can be cashed at any chartered bank or credit union. It is defined in the Canada Grain Act.
cereal grains	Cereal grains are wheat, rye, barley, oats and triticale.
certificate	The CGC issues a number of certificates assuring grain quality. These include <ul style="list-style-type: none"> • Inspection certificate, issued following an official inspection of a sample of grain • Certificate Final, issued on cargoes of grain for export, stipulates the grade and weight of the grain • Submitted sample certificate, issued for a submitted sample • Western Certificate (Eastern Division) • I-7 certificate (sample salvage)
Certificate Final	The Certificate Final is issued by the CGC for each cargo of export grain. The Certificate Final stipulates the grade and weight of the grain loaded on a vessel.
chlorophyll	Chlorophyll is the green pigment found in all green plants. It is essential for photosynthesis. In canola, seeds lose their chlorophyll as they ripen. However, canola seeds do not all ripen at once. Therefore in harvested canola, some seeds may still contain some chlorophyll.
class	Classes are defined under the Canada Grain Act. Class, in respect of grain, means any variety or varieties of grain designated by order of the CGC as a class.

commercially clean	Commercially clean shipments are shipments of grain whose dockage falls within allowed limits and is of a type normally present after standard commercial cleaning.
Commission	The Canadian Grain Commission is referred to as the CGC. The Chief Commissioner of the CGC reports directly to the Minister of Agriculture.
Commission Order	A Commission order is a directive of the CGC consistent with Section 118 of the Canada Grain Act. An order remains in effect only until the end of the crop year in which it is issued. Orders can be viewed from the CGC website at http://www.grainscanada.gc.ca/Regulatory/regmenu-e.htm#orders .
composite sample	A composite sample is composed of a number of distinct portions, each obtained in a prescribed manner from consecutive samples. The portions are blended to make the composite.
consecutive samples	Consecutive samples are samples taken one after another in a prescribed manner from the same lot of grain.
consigned car	A consigned car is a carlot of grain delivered on the basis of an arranged sales agreement between the owner of the grain and a marketing agency.
contaminated grain	<p>▲ Important: Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.</p> <p>Contaminated is defined in the "<i>Canada Grain Act</i>" as: "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the <i>Food and Drugs Act</i>."</p> <p>Determination as to whether grain is contaminated will be made by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada. Samples deemed to be contaminated are graded "<i>Type of Grain, Sample Condemned</i>."</p> <p>Paragraph 76. (1) of the Canada Grain Act specifies that operators of licensed terminal or transfer elevator must inform the CGC if they find grain to be infested or contaminated, or to have gone or to be likely to go out of condition or otherwise to require treatment. The CGC may inspect the grain.</p> <p>The CGC tells the operator how to treat or dispose of the grain. If the grain has been special binned, the elevator operator may recover the costs of treating or disposing of the grain from the owner of the grain.</p>

Paragraph 90. (1) says that a CGC inspector who believes on reasonable grounds that grain is contaminated may seize any evidence necessary to support their suspicion. Paragraph 104 says that an operator of a licensed elevator must not knowingly receive or discharge any grain, grain product or screenings that is infested or contaminated or that may reasonably be regarded as being infested or contaminated

cool and sweet	Cool and sweet are terms used to describe the condition of grain which is of a normal temperature and is free from any objectionable odour.
-----------------------	---

Cox funnel	A Cox funnel is used in determining test weight in conjunction with the 0.5-litre measure to control the flow of grain into the measure.
-------------------	--

crop year	The crop year is from August 1 to July 31 of the following year, as defined in the Canada Grain Act. The Governor in Council may, by order, vary the period of a crop year to another period of not less than three hundred and sixty-five days.
------------------	--

CWB	Canadian Wheat Board.
------------	-----------------------

damp	A sample of grain is identified as damp if the moisture content exceeds the tough range defined for that class of grain. In terms of moisture content, grain is classified as straight, tough, or damp. For corn, soybeans, sunflower seed and safflower seed, there are two additional classes of moisture content, moist and wet.
-------------	---

degermed kernels	Degermed kernels have had their germ removed. If the sample contains sprouted kernels, degermed kernels that are clearly not mechanically damaged are classed as sprouted. Degermed kernels are a grading factor for wheat, rye and triticale.
-------------------------	--

dehulled	Occasionally used for <i>hulled</i> .
-----------------	---------------------------------------

dockage

According to the Canada Grain Act, dockage is material that must be removed from grain by the use of approved cleaning equipment so that the grain can be assigned a grade. Once it has been removed from the grain, dockage is called *screenings*.

To report the percentage by weight of dockage in a sample,

For ...	dockage is ...
grain that is not commercially clean	reported in increments of 0.1%
eastern grains	assessed to the nearest 0.1%
export shipments authorized by the CGC to contain dockage	reported to the nearest 0.1%
grain graded <i>Sample Salvage, Sample Canada/CWCE Account Fireburnt</i>	not reported
samples of official carlot or trucklot shipments containing dockage within established export limits for commercial cleanliness; for example, domestic buckwheat, 2.5%	what is normally present after ordinary commercial cleaning—there is no minimum canola, 2.5%, or dockage
off-grades	dockage is covered in the section describing the specific class of grain

Allowances are made for finely broken seeds in indirect export shipments.

earth pellets

Earth pellets are a type of foreign material found in grains.

Soft earth pellets include soft fertilizer pellets, except in domestic mustard seed, and any non-toxic material of a similar consistency. Earth pellets remaining in cleaned samples are handpicked and, up to specified tolerances, their percentage by weight is added to the percentage by weight of dockage in domestic shipments to terminals. Export shipments must be practically free from earth pellets.

Hard earth pellets are stones.

Eastern and Western Grain, Mixed

Mixtures of eastern and western grain, except for corn, are graded *[class of grain] Sample Eastern and Western Mixed*. When the composition of the samples is known or can be established by analysis, it is recorded on the back of the inspection certificate.

Separate lots of western corn may be loaded to vessels without separation at the request of shippers.

Electronic Inspection System (EIS)	The Electronic Inspection System, used by inspectors to determine test weight, dockage and grading factor percentages, includes an Apple IIC computer, Mettler PE 3600 or PM 4600 electronic scale and a printer. The output from the EIS forms the complete record of the sample.
---	--

elevator	Licensed grain elevators are of four types: primary, process, transfer and terminal.
-----------------	--

End-use Certificate	End-use certificates are issued upon request for grain imported into Canada as prescribed under the Canada Grain Act.
----------------------------	---

ergot	Ergot is a fungal disease which occurs on cereals and grasses. It is most prevalent on rye, triticale, wheat, and barley, in decreasing order of occurrence. It is rarely found on oats. The disease produces hard dense fungus bodies, called <i>sclerotia</i> , having a purplish black exterior, a purplish white to off-white interior, and a relatively smooth surface texture.
--------------	--

excreta	<p>Excreta is the grading factor term used for excrement from any animal including mammals, birds and insects.</p> <p>Usually excreta are removed as dockage. Any that remains may become a grading factor.</p>
----------------	---

experimental grades	Experimental grades are established to provide the Canadian Wheat Board a way to market new varieties of wheat and barley to assess their acceptability in world markets.
----------------------------	---

fair average quality (FAQ)	FAQ is a term used in grain marketing in some countries to describe the current year's grain quality on the basis of an average sample. The FAQ is a class of grain which is said to represent the quality of a commodity produced in a given year. FAQ standards of quality may change from year to year.
-----------------------------------	--

falling number	<p>The falling number is a measure of enzyme activity as a result of sprouting. It is a measure of how many seconds it takes for a plunger to sink through a paste made of ground grain and water.</p> <p>The test works on the principle that the presence of alpha-amylase causes the gelatinized starch to be reduced to sugars, with a loss of viscosity. The loss in viscosity results in a lower falling number. Samples of grain with high amounts of alpha-amylase will have a falling number of around 70 seconds. Grain which is sound and has low levels of enzyme will have a high falling number, for example, 350 seconds.</p>
-----------------------	--

fertilizer pellets	Fertilizer pellets are pellitized plant nutrients which are typically small, hard and either round and white, or irregular-shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant. Refer to the specific grain chapter for assessment procedures.
---------------------------	--

fireburnt kernels	<p>Fireburnt kernels are kernels burned or scorched by fire. A cross-section of a fireburnt kernel resembles charcoal, with numerous air holes. These air holes result in a low-weight kernel which crumbles easily under pressure.</p> <p>The Off-Grades of Grades of Grain and Grades of Screenings Order excludes from any Class I or Class II grade any grain having a fireburnt odour or containing fireburnt kernels in excess of established tolerances, because it is not possible to separate all kernels affected by smoke or heat from samples containing grain damaged by fire.</p>
--------------------------	---

foreign grain	<p>If the inspector suspects that a sample or shipment of grain is not of Canadian origin, the shipper must provide a letter indicating the country of origin, before official grading occurs.</p> <p>Unofficial samples</p> <p>Inspection services may be provided for samples of foreign grains. Certificates or letters must clearly indicate that the grade provided is the grade the sample would qualify for if the grain had been of Canadian origin.</p> <p>Unofficial samples, terminal receipts</p> <p>Inspection records and certificates specify the class of grain and, in place of the grade, the country of origin. For example, <i>Corn, USA origin</i>.</p>
----------------------	--

foreign material	<p>Foreign material is material other than grain of the same class that remains in the sample after the removal of dockage. Foreign material found in grain samples includes</p> <ul style="list-style-type: none"> • Cereal grains, sometimes called other cereal grains • Earth pellets, soft • Ergot • Fertilizer pellets, hard • Large seeds • Matter other than cereal grains • Roughage • Sclerotinia • Small oilseeds • Small seeds • Stones <p>Many of the materials, such as stones, ergot, and sclerotinia have separate tolerances. Foreign material reduces the value—there is less desired grain for the weight or volume purchased. In addition, the presence of foreign material in grain compromises our reputation for clean grain.</p>
-------------------------	---

Even the presence of other cereal grains can compromise the quality of the predominant grain. For example, the presence of barley in wheat reduces milling yield. Oats in red spring wheat reduces milling yield and gives the flour a duller colour.

free fatty acids Oilseed quality is determined in part by the free fatty acid test.

Free fatty acids are components that reduce the smoke point in frying fats and oxidize rapidly, giving rancid flavours.

The test gives a direct measure of the processing qualities of the oil and the amount of lye required to refine oils. Top canola seed usually has less than 0.7% free fatty acids. International specifications for top grade oil are usually set at 2.0% free fatty acids.

frost damage The severity of frost damage depends on the stage of maturity of the grain, the temperature to which the grain is exposed, and the duration of exposure.

In wheat, as the degree of frost damage increases,

- Wheat milling becomes more difficult
- Flour yield decreases
- Flour ash content increases
- Flour colour becomes darker, which may not be commercially acceptable
- Bread volume, appearance, crumb structure and crumb colour deteriorate

fusarium head blight Fusarium head blight is a fungal disease of wheat and other cereal crops.

In wheat it is characterized by the presence of kernels that appear lifeless, thin and shrunk. The kernels show a whitish or pinkish fibrous mould usually occurring in the crease area but sometimes found in the germ of the kernel as well. The presence of the mould on individual kernels is confirmed using a 10-power magnifier.

Fusarium may produce mycotoxins such as vomitoxin. Affected grain may be unpalatable or toxic to animals, and is considered acceptable for human consumption only when virtually free of mycotoxins.

glucosinolates Glucosinolates are natural components of canola, rapeseed, and mustard seed. These compounds are responsible for the pungent odour and sharp flavour of cabbage, brussels sprouts, radishes, broccoli and cauliflower. They are natural toxicants, associated with goitre and liver damage when consumed in large quantities.

Glucosinolates may be desirable in mustard seed destined for condiment use. However, high levels in rapeseed restricted the use of this seed for feed. Breeding programs to reduce the level of glucosinolates in rapeseed produced canola.

grade certificate A grade certificate attests to the quality of a commodity graded by official inspectors, testers and graders. It is another name for inspection certificate.

grade code A grade code is a four-digit code used throughout the grain industry to identify each grade of each class of grain. See also *grain code*.

grades of grain Grades of grain are defined by specifications in

- The Canada Grain Regulations
- The Official Grain Grading Guide

Class	Authority	Example
I	Canada Grain Regulations	<i>Wheat, No. 1 Canada Western Red Spring</i>
II (special grades)	Canada Grain Regulations	experimental grades
III (off-grades)	Off-Grades of Grain and Grades of Screenings Order	tough, damp, rejected and sample grades
IV (screenings)	Off-Grades of Grain and Grades of Screenings Order	<i>Screenings, No. 1 Feed</i>

grading factor A grading factor is a physical condition of grain, the result of growing conditions, handling procedures or storage practices. It is a visual characteristic that indicates a reduction in quality; for example, frost damage, sprouted kernels, or heated kernels. Only relevant grading factors are shown as reasons for a grade.

- If a sample of wheat grades No. 3 for one particular reason, there is no need to list other factors that might be acceptable in a higher grade.
 - If the sample is No. 3 for a combination of reasons, the combination must be shown in order of importance.
-

grain A grain is any seed named in the Canada Grain Act or designated by the Canada Grain Regulations as a grain.

grain code A grain code is a two-digit code used throughout the industry for each class of grain. See also *grade code*.

grass-green kernels Grass-green kernels are kernels of wheat that are distinctly green because of immaturity.

grasshopper damage See *insect damage*.

groats	Groats are hulled grains, and refer to the caryopsis of domestic or wild oats; that is, it is the kernel with the hull removed.
---------------	---

hard vitreous kernels - HVK	<p>Vitreousness is the natural translucence that is a visible sign of kernel hardness.</p> <p>Hard vitreous kernels</p> <ul style="list-style-type: none"> • Are whole or broken, reasonably sound kernels that show clear evidence of vitreousness, even though they may be bleached • Include hard vitreous kernels of wheats of other classes that blend <p>Non-vitreous kernels of amber durum</p> <ul style="list-style-type: none"> • Have a starch spot of any size • Are of other wheat classes and otherwise damaged, which means sprouted, binburnt, severely mildewed, rotted, mouldy, heated, fireburnt, showing penetrated smudge, degermed, grass green, severely midge damaged, or severely frost damaged <p>Non-vitreous kernels of red spring and red winter wheats</p> <ul style="list-style-type: none"> • Are starchy • Are of contrasting wheat classes and otherwise damaged, which means sprouted, binburnt, severely mildewed, rotted, mouldy, heated, fireburnt, showing penetrated smudge, degermed, grass green, severely midge damaged, or severely frost damaged <p>HVK content is related to protein content and milling quality, which are particularly important in durum wheat. Non-vitreous kernels are produced under cool maturation conditions, abundant soil moisture and insufficient nitrogen. Flours milled from non-vitreous wheat have reduced protein content and produce poor loaf volumes. Non-vitreous kernels are not as significant in soft wheats, since low protein is desirable for most soft wheat end-products.</p>
------------------------------------	---

hazardous substance	A hazardous substance is defined in the Regulations as any pesticide, herbicide or desiccant.
----------------------------	---

heated kernels	Heated kernels have the light tan to dark brown colour or an odour typical of grain that has heated in storage. The term includes kernels discoloured from artificial drying, but not binburnt or fireburnt kernels.
-----------------------	--

hulled	Hulled kernels have the hulls removed, e.g., oat groats, peeled barley and hulled sunflower seeds.
---------------	--

hulless	Hulless kernels have naturally loose hulls or no hulls, e.g., wheat, hulless oats and barley.
----------------	---

identity-preserved	In a primary elevator, identity-preserved or special bin grain is held in a separate bin at the request of the owner.
---------------------------	---

indirect shipment	An indirect shipment from a terminal elevator is one that will be reloaded at a transfer elevator for delivery to the buyer.
--------------------------	--

insect damage	For CWRS and CWAD, there are specific limits for kernels damaged by grasshopper and armyworm, midge and sawfly.
----------------------	---

Grasshopper and armyworm damage

Grasshoppers and armyworms chew out sections of kernels, particularly the ends and sides. At an early stage, armyworms may chew tunnels through the kernels. This destroys the endosperm, and leaves the exposed chewed areas susceptible to fungal and bacterial infections. Heavy discolourations and moulds may result.

Orange wheat blossom midge

The orange wheat blossom midge causes a distinct form of damage. Grade tolerances for midge have existed for many years based primarily on the shrivelling and distortion of midge-damaged kernels. The tiny midge larvae feed directly on the developing kernels in the heads of wheat. The extent of damage largely depends on the number of larvae feeding on each kernel.

Only recently have the full effects of midge damage on Canadian red spring bread wheat quality been studied, revealing the seriousness of midge damage to quality. The shrunken distorted grains reduce flour yields and produce dark flours with increased flour ash.

Severely midge-damaged wheat exhibits weak, sticky dough properties, low baking absorption and poor bread quality. Protein content is abnormally high, but gluten protein quality is distinctly inferior.

insect infestation	The Canada Grain Regulations establish procedures for handling infested grain at primary elevators. Grain found infested at terminal or transfer elevators is handled and treated under the direction of an officer of the CGC.
---------------------------	---

According to the Canada Grain Act, infested grain is grain that contains any injurious, noxious or troublesome insect or animal pest.

Industry Services Automation	Industry Services Automation (ISA) is a networked computerized system that is incorporated into the visual grading system used by the CGC's Inspection Services for the analysis of dockage and grading factors, test weight, and moisture content. The workstation consists of a computer terminal, keyboard, and Mettler electronic scale. The output from the ISA represents the original and official Inspection Report.
-------------------------------------	--

inspection certificate	<p>A CGC grain inspector issues an inspection certificate following an official inspection of a sample of grain. The certificate must state</p> <ul style="list-style-type: none">• Where the grain was grown in Canada• The grade according to the Canada Grain Act• Dockage• Other relevant information
-------------------------------	--

invisible losses	<p>Invisible losses are normal losses of weight of grain during normal handling. Shrinkage allowances are provided to prevent gross weight losses from affecting the net weight of an elevator's grain stocks.</p> <p>Invisible weight losses are primarily from</p> <ul style="list-style-type: none">• Dust losses during handling• Moisture losses during storage• Unexplained weight losses in oilseeds during storage
-------------------------	--

iodine value	<p>Iodine value is a measure of the total amount of unsaturated fatty acids in an oil. In flaxseed, iodine values of 189 or greater are required for the manufacture of paints and inks. Lower values, around 182, are needed for the manufacture of linoleum.</p>
---------------------	--

K	<p>The letter K in grade tables refers to the number of kernels or kernel-sized pieces of a particular grading factor in a 500-gram sample.</p>
----------	---

laker	<p>A laker is a long, shallow draft ship designed to transport cargoes within the inland water system of the St. Lawrence Seaway.</p>
--------------	---

large seeds	<p>Large seeds are considered foreign material in some classes of grain. Large seeds include domestic and wild seeds that remain on top of the No. 4.5 round-hole sieve.</p>
--------------------	--

load lines	<p>Load lines are the centimeter graduations by which the level of grain in a railcar is measured.</p>
-------------------	--

manufactured products	<p>Manufactured products are materials other than grain cleanings and includes materials such as malted, crushed, or ground grain which cannot be assigned a grade. Inspection may be performed on request. Certificates issued have only the composition endorsed on the back, providing the identification of the components is unquestionable; for example, <i>80% crushed wheat, 15% crushed barley, 5% whole wheat</i>. On the face of the certificate, <i>Manufactured product</i> is indicated.</p>
------------------------------	--

marine leg	<p>A marine leg is a mechanical device used to offload bulk grain from the hold of a vessel, normally from a laker into a transfer elevator.</p>
-------------------	--

matter other than cereal grains	Matter other than cereal grains is a type of foreign material. It includes large seeds and seeds of such grains as buckwheat, peas, corn and beans, and may include coarse vegetable matter.
midge damage	<p>Midge damage is found mostly in wheat, although it has been detected in barley, rye, and some grasses.</p> <p>The only part of the plant damaged is the developing seed. When a kernel of grain is attacked either it will not develop or it will develop as a shrivelled, deformed kernel. Infestations of the wheat midge can significantly reduce yield. They are most severe when rainfall is high during the spring or summer.</p> <p><i>See insect damage.</i></p>
mildew	<p>Mildew is a fungal condition that affects wheat, barley and a number of other grains. It develops in unthreshed kernels of grain, usually under conditions of excessive moisture. It should not be confused with the disease powdery mildew, which attacks the leaves, reducing yield.</p> <p>Downy mildew, caused by <i>Peronospora manshurica</i>, can sometimes form a white coating on soybeans. These are spores of the fungus. They do not affect the processing or safety of the seed, but can affect the appearance.</p>
mineral matter	Mineral matter refers to stones, earth pellets, and fertilizer pellets that may be found in samples of grain.
moist	A sample of grain is identified as moist if the moisture content exceeds the <i>damp</i> range established for that class of grain.
moisture content	<p>Moisture content is a measure of the water content of grain.</p> <p>Grain that is within acceptable limits of moisture is referred to as a straight grade. With increasing moisture content, grain may be referred to as <i>tough</i>, <i>damp</i>, <i>moist</i> and <i>wet</i>. See Chapter 2, <i>Moisture testing</i>.</p>
mudball bean	Mudball beans are beans or soybeans completely covered with caked-on mud.
mycotoxins	<p>Mycotoxins are poisonous substances produced by some species of fungi.</p> <p>For example, several <i>Fusarium</i> species can cause a disease called fusarium head blight. One of the more important species of fusarium, <i>Fusarium graminearum</i>, can produce several mycotoxins, most commonly, deoxynivalenol or vomitoxin, which, when present in feed grain, is distasteful and can reduce the rate of weight gain in some animals.</p>

In corn, *Fusarium graminearum*, also called *Gibberella zeae*, causes the disease gibberella ear rot. Besides deoxynivalenol, another compound known as zearalerone may be formed. This compound has estrogen-like effects, especially in pigs and cattle.

non-Board grain	Non-Board grain is grain marketed through the open market system. Such grain includes domestic feed wheat and barley, rye, oilseeds and specialty crops.
non-vitreous	See <i>hard vitreous kernels (HVK)</i> .
not commercially clean	Shipments of grain whose dockage content falls outside of allowed limits. See <i>commercially clean</i> .
objectionable odour	An objectionable odour is one not normally associated with grain, such as skunk, sour, musty, oil, or gas. Heated or fireburnt odours are identified specifically and not included in the general category of objectionable odour.
Off-Grades of Grain and Grades of Screenings Order	The Off-Grades of Grain and Grades of Screening Order is issued by the CGC. It provides the authority for the application of the grading terms rejected, sample, tough, damp, moist, and wet, and defines grades of screenings. The Off-Grades of Grain and Screenings Order is available through the CGC web site at www.cgc.ca . The direct address is http://www.grainscanada.gc.ca/Regulatory/rcgmenu-e.htm#orders
official carlot unload sample	An official carlot unload sample is a sample taken by a CGC grain inspector or by any sampling device authorized by the CGC as a railcar is unloaded at a terminal elevator.
official grading	An official grading is one conducted by an inspector of the CGC on an unofficial sample.
official inspection	An official inspection is done when an official sample of grain is graded by a CGC inspector.
official sample	An official sample of grain is drawn under the direct control or continuous supervision of an authorized employee of the CGC.
official weighing	An official weighing is done on approved equipment under the supervision authorized by the CGC or in a manner authorized by the CGC.
oilseeds	Oilseeds include flaxseed and solin, canola and rapeseed, soybeans, safflower and sunflower seed.

**optional
analysis**

Where a shipper requests special cleaning of a carlot of grain at a terminal or transfer elevator, and the elevator manager agrees, dockage material will be analysed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported and elevator stocks will be adjusted on the basis of the analysis. Agreement between the shipper and unload elevator must be conveyed to the CGC in writing prior to the analysis being performed.

**Order of
Precedence**

The following list is used to assign reasons for *Sample* grades.

1. *Sample Account Admixture, Contaminated grain*
2. *Sample Salvage*
3. *Sample Account Fireburnt*
4. *Sample Account Excreta*
5. *Sample Account Fusarium*
6. *Sample Account Ergot*
7. *Sample Account Odour*
8. *Sample Account Rotted*
9. *Sample Account Heated*
10. *Sample Account Mildewed*
11. *Sample Account Damaged*
12. *Sample Account Damage and Foreign Material*
13. *Sample Account Dehulled*
14. *Sample Account Stained Kernels*
15. *Sample Account Sprouted*
16. *Sample Account Admixture*
17. *Sample Account Splits*
18. *Sample Account Lightweight*
19. *Sample Account Stones*
20. *Sample Account Mixed Colours*

**other cereal
grains**

A cereal grain mixed into another type of cereal grain is considered foreign material. The presence of other cereal grains affects the processing quality of the main grain.

In ...	other cereal grains are ...
wheat	rye, barley, oats, triticale
rye	wheat, barley, oats, triticale
barley	wheat, rye, oats, triticale
oats	wheat, rye, barley, triticale
triticale	wheat, rye, barley, oats

**other
matter**

Other matter refers to inseparable material excluding cereal grains, large seeds, wild oats, stones, mineral matter, ergot and sclerotinia.

out of condition	<p>Grain which is out of condition has deteriorated in storage. Grain that is damp, heating or spoiling in storage requires special treatment such as drying or aeration to preserve its quality or to prevent further deterioration.</p> <p>Paragraph 76. (1) of the Canada Grain Act specifies that operators of licensed terminal or transfer elevator must inform the CGC if they find grain that is or is likely to go out of condition. The CGC may inspect the grain. The CGC tells the operator how to treat or dispose of the grain. If the grain has been special binned, the elevator operator may recover the costs of treating or disposing of the grain from the owner of the grain.</p>
pass-on slip	<p>A pass-on slip is a document given to the captain or mate of a vessel by the CGC inspector when grain is loaded into the vessel from a terminal elevator.</p> <p>The information on the slip includes the vessel name, exact storage of all grades of grain loaded, a diagram of the stowage plan, the date, and the loading terminal. This slip is collected by the inspector in charge of the next loading elevator.</p>
pink kernels	<p>Pink pigment in wheat kernels is an indication of immaturity.</p>
primary elevator	<p>A primary elevator is a licensed elevator used to accept deliveries of grain directly from producers for storage or forwarding.</p>
process elevator	<p>A process elevator is an elevator which is used principally to receive and store grain for processing directly into other products.</p>
processed sample	<p>A processed sample is a sample of grain that appears to have been cleaned at seed cleaning plants before being delivered to terminal or transfer elevators.</p> <p><i>See unprocessed sample.</i></p>
producer car	<p>A producer car is a railcar that is loaded and shipped by a producer to a terminal elevator. Producers apply to the CGC to have a railcar allocated to them.</p>
pulses	<p>Pulses are crops grown for their edible seeds, such as peas, lentils, chick peas or beans.</p>
reference variety	<p>A reference variety of a grain is a variety currently listed as registered in Canada by AAFC.</p>
registered variety	<p>A registered variety is a variety of grain registered under the authority of the Canada Seeds Act and listed on the Variety Order List.</p>

Regulations	<p>Canada Grain Regulations. The Regulations can be viewed through the CGC web site at www.grainscanada.gc.ca</p> <p>The direct address is http://www.grainscanada.gc.ca/Regulatory/Regulations/regs1-c.htm.</p>
rejected grades	Rejected grades are defined in the Off-Grades of Grain and Grades of Screenings Order. The term is not used in grading eastern grain. Numerical grades of western grain may be graded rejected only because of stones. If the stones are removed, the Rejected designation is dropped.
representative sample	Grades are based on samples. To ensure samples adequately reflect the entire lot of grain, proper sampling procedures must be used. Official samples are taken using continuous sampling devices. The CGC publishes a factsheet on sampling procedures, called <i>Taking a Representative Sample</i> .
retention time	See <i>storage of samples</i> .
rotted	Rotted kernels are decomposed or decayed because of bacteria or fungi. Rot is usually indicated by blackening, discolouration and softening of all or part of the kernel.
roughage	Roughage is a type of foreign material found in grains. It includes chaff, loose hulls, empty seed pods, knuckles, etc., that are readily removable by aspiration, handpicking, or other cleaning procedures.
running sample	A running sample is a sample obtained while grain is being conveyed on a belt or as it flows from a spout.
saltie	A saltie is a vessel designed for ocean navigation.
sample	<p>A sample is a portion of grain taken to represent an entire truckload, carload or cargo.</p> <p>The size of a sample to be analysed for the presence of specific grading factors is established for each class of grain in its section. The term approximate is often used, allowing inspectors to take into consideration the concentration of the grading factor in the sample.</p> <p>Types of samples include</p> <ul style="list-style-type: none"> • average sample • cargo sample • composite sample • consecutive sample • official carlot unload sample • official sample • processed sample • running sample • standard sample • submitted sample • unprocessed sample

Sample Eastern and Western Mixed See *Eastern and Western Grain, Mixed*.

sample grades Sample grades are defined in the Off-Grades of Grain and Grades of Screenings Order. Grain that is not eligible for Class I or II grades under the Canada Grain Act is graded *Sample*. With the exception of sample salvage, reference is made in all sample grades to Canada (CAN), Canada Western (CW) or Canada Eastern (CE); for example, *Barley, Sample CW Account Heated*.

Only the major grading factor forms part of the grade name. Secondary reasons for a sample grade are noted in remarks; for example, a sample of rye having a strong chemical odour and containing 9.0% by weight of heated kernels might have the following comments:

- The grade is *Rye, Sample CW/CE, Account Odour*.
- The inspector's remarks on form I-12 are *strong chemical odour, 9.0% heated*.

The remarks section of the inspection record for samples graded *Sample CW/CE/Canada* may include the following:

- For wheat, the class or classes of wheat eligible for sample grades
- The nature and concentration of admixture in samples graded *Sample CW/CE/Canada, Account Admixture*
- The kind of odour in samples graded *Sample CW/CE/Canada, Account Odour*

When sample grades are assigned, the reason shown for the grade is selected according to the Order of Precedence.

sample interval A sample interval is the time between the repeated sample-capturing action of a sample method or device.

sample retention time See *storage of samples*.

sample salvage Any grain salvaged from a wreck in transit containing over 2.5% by weight of stones or any other conspicuous ground material, removable or not, is graded [*class of grain*], *Sample Salvage*. For example, *Wheat, Sample Salvage*.

- Admixtures of inseparable seeds or other grains are disregarded if they do not exceed the tolerances permitted in the lowest grade of that grain.
- The composition of official samples is entered on inspection records and endorsed on the back of certificates.
- The composition of unofficial samples is shown on the face of form I-7 certificates and the I-12 form.

sample size to be analysed	The size of a sample to be analysed for the presence of specific grading factors is established for each class of grain in its section of this guide.
-----------------------------------	---

sawfly damage	<p>The wheat stem sawfly has caused serious harvest losses to spring wheat in the prairie region. It attacks the base of stems causing tillers of mature plants to break off. Early swathing can reduce spring wheat harvest losses, but the most effective means of managing this insect pest has been the production of resistant cultivars.</p> <p><i>See insect damage.</i></p>
----------------------	---

scalp	Scalping refers to the removal of roughage material in a sieving process.
--------------	---

sclerotia	<p>Sclerotia are hard, compact masses of fungal mycelium that serve as resting or survival structures.</p> <p>One type of sclerotia is the mass of fungal tissue produced by the soil-borne fungus <i>Sclerotinia sclerotiorum</i>, which attacks crops such as sunflower and canola. Infections result in yield loss. While it does not attack cereal crops, sclerotia may be found as contaminants in samples of cereal grains from infected fields.</p>
------------------	--

screenings	Screenings are dockage material have has been removed by cleaning from a parcel of grain. Screenings qualify for Class IV grades. <i>See Off-Grades of Grain and Grades of Screenings Order.</i>
-------------------	--

shipment order slip	The shipment order slip is given by the terminal elevator operator to the inspector in charge. It indicates the quantity and grade of grain ordered for shipment.
----------------------------	---

shrinkage allowances	A shrinkage allowance is deducted from the gross weight of grain delivered, to adjust for the normal loss of weight, sometimes called invisible losses, during handling of grain.
-----------------------------	---

shrunk kernels	<p>Shrunk kernels in wheat are whole kernels that pass through a No. 4.5 slotted sieve.</p> <p><i>See thin and shrunk.</i></p>
-----------------------	--

sieves	Sieves used in dockage assessment and grading procedures are listed in the Canada Grain Regulations. The accuracy of sieves used by the CGC is regularly monitored. <i>See Chapter 3 of this guide, Specifications for sieves.</i>
---------------	--

small oilseeds	Small oilseeds include flaxseed, canola and domestic mustard seed.
-----------------------	--

small seeds	Small seeds are considered foreign material in some classes of grain. It includes all seeds removable through a No. 4.5 round-hole sieve.
--------------------	---

smudge

Smudge refers to dark discolourations caused by fungal or bacterial infection. The discolouration may be brown, black, or reddish. It occurs mainly in wheat and barley.

According to the Regulations, smudge is more severe than blackpoint.

If discolouration occurs on . . .	Then the kernel is considered . . .
more than one-half of the surface, or infection extends into the crease	smudge-damaged
less than one-half of the bran surface, no discolouration in the crease	blackpoint-damaged

Penetrated smudge

Penetrated smudge is characterized by discolouration penetrating and extending throughout the endosperm, usually as a result of a serious infection of a fungus such as the various species of *Alternaria*.

Superficial discolouration

Superficial discolouration is a reddish discolouration not penetrating the endosperm. This factor will be evaluated subjectively in relation to the degree of soundness without reference to specific tolerances.

Red smudge

Red smudge is a dark reddish discolouration usually associated with durum wheat. It usually affects the entire bran portion of the kernel. Discolouration is not superficial and cannot be removed through abrasion. Red smudge is caused by infections of the fungus *Pyrenophora tritici-repentis*, which also causes the leaf disease tan spot.

smut

See *bunt*.

soundness

Soundness refers to overall visual grain quality. Sound grain is reasonably well matured and reasonably free from kernels damaged by frost, mildew, bleaching, or weather.

special bin grain

In a primary elevator, special bin grain is held in a separate bin at the request of the owner. It is sometimes referred to as identity-preserved.

In a terminal elevator, special bin grain is held by authority of the CGC in bins registered by bin numbers in the owner's name.

special cleaning

Special cleaning refers to any cleaning of grain in addition to the usual dockage assessment procedures. Special cleaning is used to improve the grade of the grain.

special crops	Special crops are considered to be beans, buckwheat, chick peas, corn, fababeans, lentils, mustard, peas, safflower, soybeans, sunflower, and triticale.
----------------------	--

spiral cleaner	The spiral cleaner removes flat seeds from yellow mustard seed.
-----------------------	---

sprouted	<p>Kernels are classed as sprouted when any of the following conditions exist:</p> <ul style="list-style-type: none"> • Growth is evident in the germ area. • Bran is noticeably split over the germ. • The germ is removed and there is discolouration normally attributable to sprouting. • The germ, though intact, is distinctly swollen because of growth. <p>Severely sprouted</p> <p>Only CWRS wheat is evaluated for severely sprouted. Kernels are considered severely sprouted when</p> <ul style="list-style-type: none"> • Sprouts extend beyond the normal contours of the germ • Kernels are severely degenerated as an apparent result of advanced sprouting
-----------------	--

stained kernels	<p>Staining can be artificial or natural.</p> <p>Artificial stain</p> <ul style="list-style-type: none"> • Includes any stain on kernels caused by contact with foreign substances such as dye or adhered foreign material such as oil, grease, paint or soot • Does not include any stain caused by poisonous substances <p>Natural stain</p> <p>Natural stain is any stain on kernels caused by contact with natural substances such as smut spores, soil, or weeds. Consideration is given to</p> <ul style="list-style-type: none"> • The number of affected kernels • The nature of the stain • The severity of the stain <p>Consideration is given to the incidence of affected kernels and the nature and severity of the stain.</p> <ul style="list-style-type: none"> • The nature of the adhered material is indicated on inspection records. • When the nature of the material is in doubt, the sample is sent to the Chief Grain Inspector for review, and, if necessary, for laboratory analysis. <p>See <i>weed stain</i>.</p>
------------------------	---

standard samples

The Eastern and Western Standards Committees meet annually and recommend to the CGC primary and export standard samples of grain for use in grading during that crop year.

Primary standard samples

Primary standard samples are prepared for most grades of grain and represent as nearly as possible the minimum quality of each grade, considering the predominant grading factors in the current crop. They are used as visual guides to grading grain before and on delivery at terminal elevators, and on shipments from terminal elevators when no export standard sample is established for a grade.

Export standard samples

Export standard samples are created only for Canada Western grains. They are prepared for most grades of wheat and general purpose grades of barley and govern grading of shipments out of terminal, transfer, and process elevators. They are intended to ensure that the buyer receives grain that is reasonably close in quality to the average of the grade.

Minimum test weights, maximum limits of admixtures and grading factors in general are demonstrated in the export standard samples. However, overall quality is always considered. An export shipment may be assigned a certain grade although the shipment is slightly below the requirements in one factor, provided that in the judgment of the inspector it is sufficiently superior in other factors to be equal in overall quality to the export standard sample. Final decisions on the grade of such shipments are made only by senior officials of CGC's Inspection Services.

stones

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones, except in Domestic mustard Seed, when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Stones are considered foreign material in grain samples.

Stones removed are classified as dockage if they are readily removable by ordinary cleaning methods or by special cleaning procedures.

**storage
of samples**

Official carlot, trucklot, or vessel loading samples and submitted samples are retained for at least the minimum time specified for reinspection in the Canada Grain Act or Regulations. The sample retention time is as follows, beginning on the day of inspection,

Type of sample		Retention
vessel cargo samples	direct export shipments	6 months
	indirect export shipments	10 months
guaranteed representative samples		120 days
official probe samples		120 days
official unload samples	general	20 to 30 days
	special bin	30 days
	producer cars	30 days
unofficial samples		30 days

stowage

Stowage refers to the location or hold where grain has been loaded to a vessel.

straight

Straight grades of grain are those within accepted limits of moisture. With increasing moisture content, grain is graded *tough*, *damp*, *moist*, or *wet*.

**submitted
sample**

A submitted sample is an unofficial sample sent in by a grain company or producer for grading or for other tests. The CGC charges a fee for any analysis on a submitted sample.

**terminal
elevator**

A terminal elevator is a licensed elevator used principally to receive grain and condition grain for export.

An inland terminal elevator is an elevator—licensed as a primary elevator—for receiving and conditioning of the grain for direct or indirect export.

test weight

Test weight is the weight of a measured volume of grain expressed in kilograms per hectolitre. For procedures, see Chapter 1 of this guide, *Determining test weight*.

**thin and
shrunken**

Hot dry conditions during maturation of wheat can severely reduce kernel size and cause shrunken kernels. As a result

- Test weight is reduced
- Flour yield is reduced
- More small kernels are removed during cleaning

transfer elevator	<p>A transfer elevator normally</p> <ul style="list-style-type: none"> • Receives grain that has been officially graded and weighed at a terminal elevator • Stores that grain before it is loaded to vessels for export
treated seed and other chemical substances	<p>Treated seed</p> <p>Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These include protection of the germinating seed from insects and pathogens, and increasing the availability of nutrients to the seed when planted. Seed treatment dressings may contain one or more insecticides or fungicides, and seed inoculants usually contain either a fungus or bacteria. Both types of seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals- pink or red, canola - baby blue or green.</p> <p>Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.</p> <p>Other chemical substances</p> <p>Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.</p>
trier	A trier is a hollow cone-shaped device used to obtain samples manually from bagged grain.
tombstone kernels	Tombstone kernel is an obsolete term for a fusarium-damaged kernel.
tough	Grain is identified as tough if the moisture content exceeds the <i>straight</i> range established for that class of grain but is not <i>damp</i> .
unofficial sample	An unofficial sample is a sample drawn without the supervision of an authorized employee of the CGC.
unprocessed sample	<p>Unprocessed samples of grain are those which have not been cleaned commercially.</p> <p>See also <i>processed sample</i>.</p>
unregistered variety	<p>Unregistered variety is sometimes used for the term non-registered variety.</p> <p>See <i>registered variety</i>.</p>

Variety Order List	The Variety Order List lists the varieties of seeds that have been registered for production in Canada under the authority of the Canada Seeds Act. Section 28 of the Canada Grain Act authorizes the grading of varieties not included under the Order into the lowest grade established by regulation for that kind of grain.
vomitoxin	Vomitoxin or deoxynivalenol is a mycotoxin produced by <i>Fusarium graminearum</i> .
Western Certificate (Eastern Division)	<p>The Western Certificate (Eastern Division) is an export certificate issued in eastern Canada for corn loaded to a laker. It includes a statement of agreement between the shipper and purchaser indicating further inspection is not required.</p> <ol style="list-style-type: none"> 1. The shipper originates the request for this type of certification before shipment. 2. The Western Certificate is issued to indicate quality at initial loading. 3. Any subsequent handling that increases breakage and lowers the grade becomes the responsibility of the buyer rather than the seller.
weed stain	<p>A weed stain is a type of natural stain. A weed stain refers to</p> <ul style="list-style-type: none"> • The blotched or stained appearance of kernels caused by contact with the sap from green foliage of such weeds as Russian thistle • Kernels with adhered foliage of weeds
wet	A sample of grain is identified as wet if the moisture content exceeds the moist range established for that class of grain. With increasing moisture content, grain is graded <i>straight, tough, damp, moist, or wet</i> .
wheat classes	<p>The following wheat classes are produced in Canada and are graded according to specifications detailed in the Guide.</p> <p>Canada Western/Eastern Amber Durum (CWAD) (CEAD) Canada Western Red Spring (CWRS) Canada Western Red Winter (CWRW) Canada Prairie Spring Red (CPSR) Canada Prairie Spring White (CPSW) Canada Western Extra Strong (CWES) Canada Western/Eastern Soft White Spring (CWSWS) (CESWS) Canada Eastern White Winter (CEWW) Canada Eastern Red (CER) Canada Eastern Red Spring (CERS) Canada Eastern Hard Red Winter (CEHRW) Canada Eastern Soft Red Winter (CESRW)</p>

wheats of other classes	Other classes of wheat are all classes of wheat including non-registered varieties, other than the predominant class in the sample. Contrasting classes are classes of a different coloured wheat; for example CWAD is a contrasting class in CWRs.
--------------------------------	---

wild oats	Wild oats is an annual grassy weed. It reduces crop yield, increases dockage and cleaning costs, lowers the grade, and is costly to control. Seeds of wild oats vary in colour from white to black. They are normally more slender than domestic oats and have a slanting, circular, depressed scar—sometimes called a sucker mouth—at their base, and a bent twisted awn.
------------------	--

working sample	A working sample of grain is usually around 1000 grams. It may be more or less, at the discretion of the inspector.
-----------------------	---

www.grainscanada.gc.ca

The World Wide Web address for the Canadian Grain Commission.